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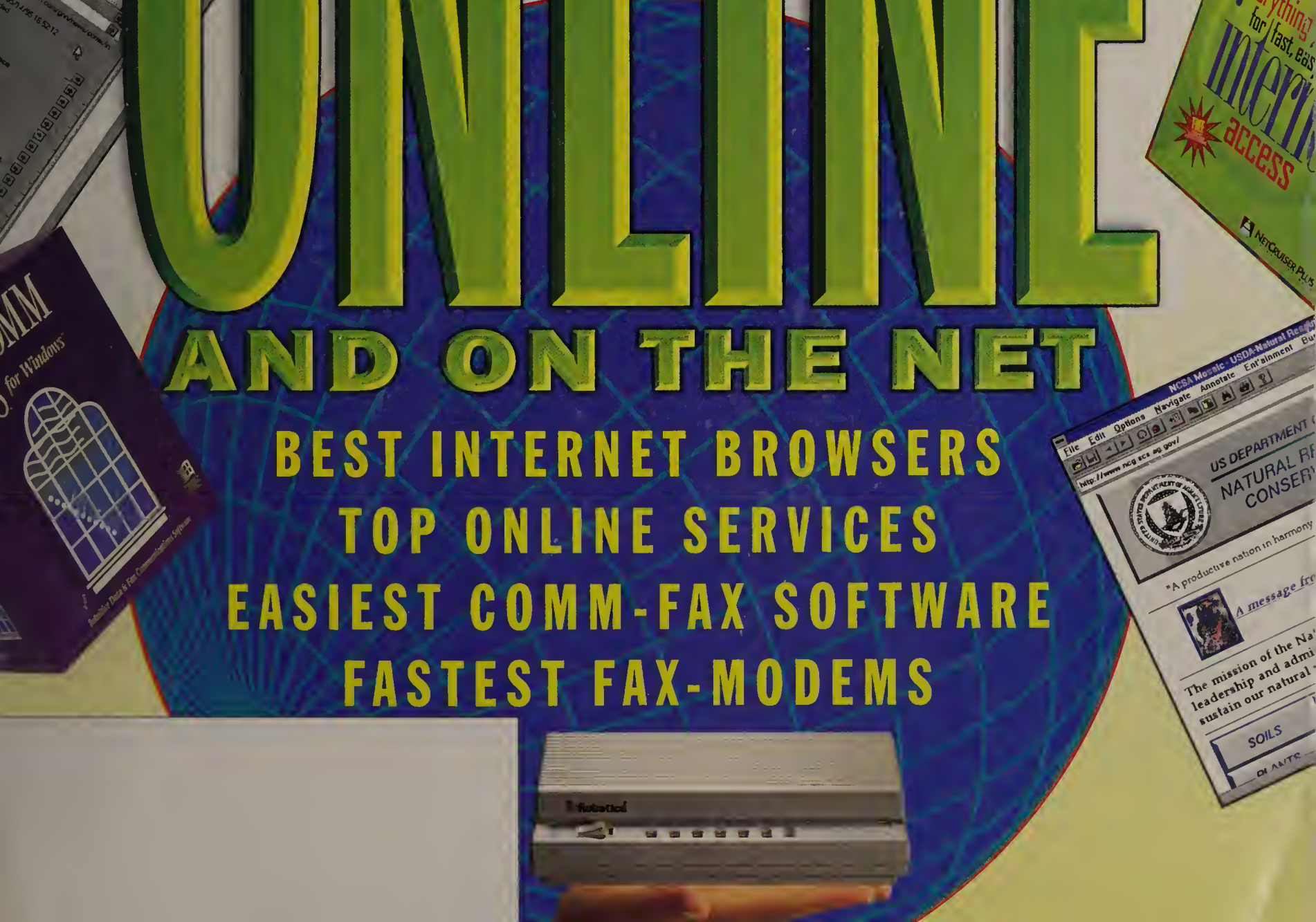

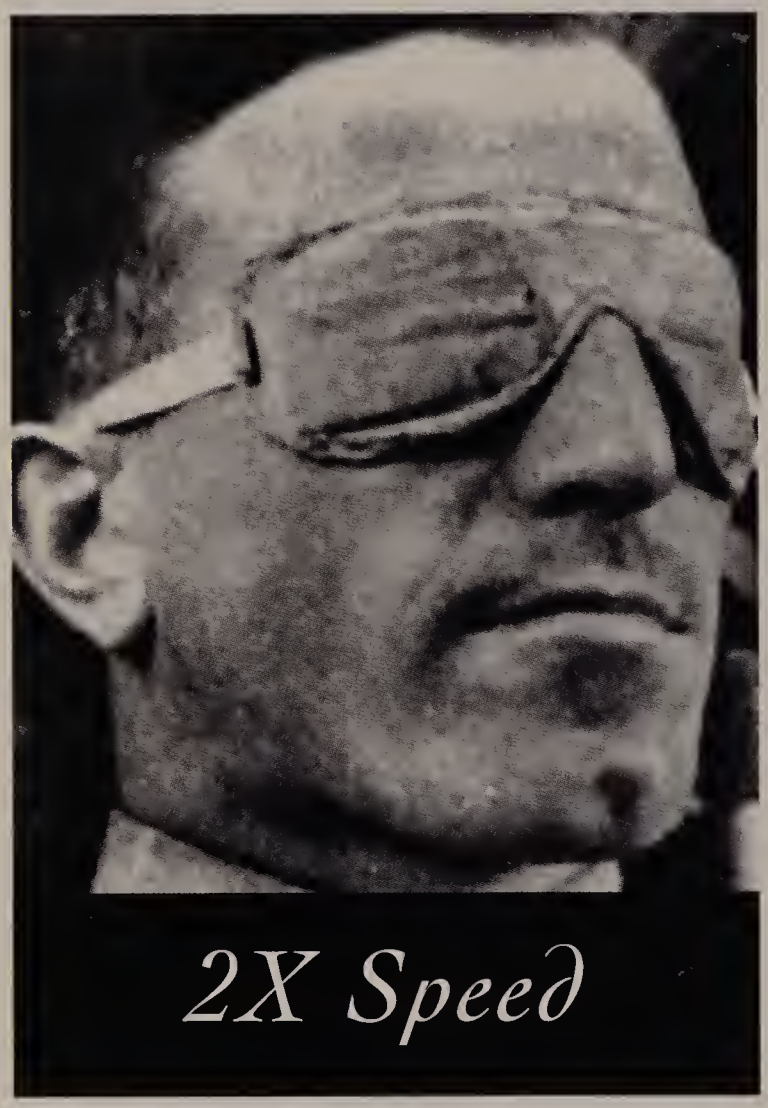

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Lotus: Get the Most From the Lotus Suite

116-L6 Our Favorite 1-2-3 Add-Ons
These templates and utilities broaden your spreadsheet's potential.

116-L15 The Cheapskate's Guide to 1-2-3 Enhancements
Find great software goodies from user groups and online services.

116-L17 Get the Support You Need
This overview helps you choose the right support option.

116-L21 Give Your PC a SmartSuite Tune-Up
Follow these tips to add zip to SmartSuite for Windows.

116-L1 Editor's Page
116-L2 News
116-L5 Fax-Back Survey
116-L24 Improving Your Skills
116-L27 1-2-3 Tips
116-L29 Q&A
116-L33 Macros
116-L36 Suite Success: Notes

Cover artwork: Steven Lyons

Cover Story

120 All You Need to Go Online
From the Internet to online services, from modems to fax-comm software, we show the most rewarding ways to get wired.

122 Best Web Browsers

141 Best Online Services

153 Best Fax-Communications Software

164 Best Fax-Modems

Systems

180 Top 20 PCs: Clocking In at 120 MHz
Hungry for speed? Pentium-120s are the ticket. Led by the Dell Dimension XPS P120c, they dominate our Power Desktops chart. Other winners: Micron's 4100 Magnum, AST Ascentia 910N, and WinBook's XP SX-33 Monochrome.

Reliability and Service

224 Reliability and Service: Boom and Bust?
As home PCs proliferate, service woes plague both business users and home-PC buyers. Which vendors best meet customers' needs? Our survey tells the story. Plus, ratings for major notebook vendors.

Top of the News

58 Windows 95: Ready or Not
Many beta testers laud the new interface and Plug-and-Play ease of use, but others are finding disquieting bugs, unfinished features, and few working communications tools. When it finally ships in August, how buggy will it be?

62 Web Publishing Made Easy
Combining the impact of advertising and the interactivity of phones, a well-designed Web site is becoming integral to doing business. Here's where to start.

66 Ami Pro—New Name, New Face
Overdue upgrade has workgroup features.

68 Plextor First With 6X CD Drive
6X CD drives approach hard-disk speed.

VOLUME 13
NUMBER 6

Graphics Boards

245 Top 10 Windows Accelerators: Terminator Triumphs
Hercules' DRAM board is the first of its kind to claim the title of "fastest ever."

Special Report: Multimedia

249 CD-ROMs: What's Hot, What's Not
This roundup of new CD titles showcases the power and appeal of high-end video and audio. Some favorites: A Passion for Art, with breathtaking masterpieces; and Xplora 1: Peter Gabriel's Secret World, a disc with compelling content accessed through an intriguing interface. Plus multimedia hardware to drool over, from a 7-platter CD drive to a surround-sound 3-D audio system.

Reliability & Service Monitors

238 Win an Am486-80 PC and a Notebook
How satisfied are you with your personal computer? Fax in this survey for a chance to win a Polywell Poly 486-80VB, a Best Buy PC from this month's Top 20 charts. And if you use a notebook PC, fill out our new survey on page 240 for a chance to win a Compaq Contura 400c, a Best Buy notebook this month.

Here's How

262 Help Line
266 Spreadsheets
270 Word Processing
276 Windows
282 Data Management
284 Publishing & Presentations
286 Hardware
290 Star-Dot-Star

Departments

15 In This Issue
19 Letters
27 Consumer Watch
41 Real Problems, Real Solutions
55 Full Disclosure
336 Break Time
338 Home Office

New Products

77 AT&T Globalyst 300 and 600 series PCs
77 HP Colorado T1000 backup tape drive
78 LifeTime Mouse, Pro-Agio, TrackMan Vista
82 Canon BJC-70 printer
82 HP ScanJet 3c scanner
87 Sidekick 2.0 personal information manager
87 Individual Stock Investor 3.0 investment software
90 Peachtree First Accounting 1.0
90 UnInstaller 3.0
94 MapLinx 3.0
94 Boris document and disk management software
95 TeamFlow 4 for Windows
97 CD Cabin for Windows
102 Material World CD-ROM
103 The Parents' Guide to Money CD-ROM
106 Timbuktu Pro for Networks 1.0
106 RadioLAN/10
108 TimeVision Network Scheduler
110 PowerSync 2.0
114 Quick Takes

Resources

12 How to Contact PC World
217 PC World Connect Information by Fax
288 Coming Up
293 Mail-Order Shopping Guide
318 PC World Catalog
329 Reader Service Card
331 Advertiser Index
333 Editorial Product Index

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ZEOS® Pantera™

"...The Kind Of High-End System We Should All Have."

– *PC/Computing*, April 1995

With high perfomance and a low price, ZEOS Pantera scores big—and so will you.

PC/Computing said the Pantera is "a definite winner."

Windows Sources agreed: "The clear winner is the ZEOS Pantera. Its scores were the best across the board."

Windows Magazine said: "ZEOS clobbers the competition."

PC Magazine concurred, calling the Pantera line "overall performance leaders."

Unparalleled in the history of personal computing, the Pantera has continuously earned award after award—review after review—from *PC Magazine, PC World, PC/Computing*, *Windows Magazine,* and many more.

Without a doubt, leading experts from top industry publications agree that the ZEOS Pantera is your No. 1 high-performance PC.

Top-Ranked Performance

The Pantera, based on Intel's 486, DX4 and Pentium processors, leaps ahead of the pack with record-breaking performance and awesome power.

In a Pentium and 486 roundup, *PC Magazine* gave top honors to ZEOS Pantera: "Few product lines fared as well in our price/performance index as the ZEOS Pantera family....The Pentium machines produced first-place scores in their respective tiers, and the ZEOS 486DX2-66 earned a top-five ranking...."

What makes the Pantera the top performer? Superior engineering—starting with a ZEOS designed motherboard created specifically to take full advantage of the latest technological advancements. The motherboard is loaded with exceptional features such as PCI Local Bus expansion which delivers 32-bit data at a rate up to 132MB per second, an on-board PCI Local Bus Enhanced IDE Controller, and support for up to four IDE devices. EIDE hard drives are available to 1.2GB standard, upgradable to 4GB SCSI. For optimum EIDE hard drive performance, the Pantera even supports Programmed I/O Mode 4, which gives you the fastest data transfer rates possible.

And there's more performance enhancing features like a Diamond Stealth 64-bit PCI local bus video card *standard* for the ultimate video solution, and a 4X CD-ROM for increased data transfer rates.

The Pantera's performance is top ranked. In fact, *Windows Magazine* gave it their prestigious 1995 WIN 100 award. They said: "The Pantera 90 slashed through our benchmarks...."

Buy With Confidence

ZEOS is committed to providing you with an excellent value. With all the extras, options, and compatibility with all major operating systems—including Novell NetWare and OS/2—you can't go wrong with the award-winning ZEOS Pantera.

yes
It runs with NetWare

And with our *Computers Now!*® program, many of our most popular money-saving Pantera packages are ready to ship *the same day you order*—look for the CN! logo. We also give you the option to custom-design a system to your computing needs.

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With striking performance, unequaled reliability and definitive value, the ZEOS Pantera is charting a new course in personal computing. It will make you the winner. To get the *Fastest Cat* around, call your ZEOS Systems Consultant today at 800-554-5220.

PC MAGAZINE EDITORS' CHOICE — Pentium-66 April 12, 1994; DX4-100 June 28, 1994

COMPUTER SHOPPER — Pentium-60 April 1994; Pentium-90 August 1994

PC WORLD BEST BUY — 486DX2-66 January 1994, February 1994, March 1994, June 1994, December 1994, January 1995, February 1995, March 1995, April 1995; DX4-100 October 1994, November 1994, December 1994; Pentium-60 December 1994, January 1995, February 1995, April 1995; Pentium-66 June 1994, July 1994, August 1994, September 1994; Pentium-90 August 1994, September 1994, October 1994, November 1994, January 1995, February 1995

PC Magazine Best — Pentium-66 May 1994; Pentium-90 February 1995

Windows Magazine Experts' Pick — Pentium-66 June 1994; Pentium-90 August 1994

Windows Magazine 1994 Recommended — Pentium-90 November 1994

WINDOWS 1995 WIN 100 — Pentium-90 May 1995

Package 1		Package 2		Package 3		Package 4	
486DX2-66	$1345	486DX2-66	CN! $1645	486DX2-66	CN! $2145	486DX2-66	$2545
DX4-100	$1445	DX4-100	$1745	DX4-100	CN! $2245	DX4-100	$2645
Pentium-60	$1595	Pentium-60	CN! $1895	Pentium-60	$2395	Pentium-60	$2795
Pentium-75	$1645	Pentium-75	CN! $1945	Pentium-75	CN! $2445	Pentium-75	$2845
Pentium-90	$1795	Pentium-90	$2095	Pentium-90	CN! $2595	Pentium-90	$2995
Pentium-100	$1945	Pentium-100	$2245	Pentium-100	$2745	Pentium-100	$3145
Pentium-120	$2245	Pentium-120	$2545	Pentium-120	$3045	Pentium-120	$3445
➤ 4MB RAM		➤ 8MB RAM		➤ 16MB RAM		➤ 24MB RAM	
➤ **528MB** local bus IDE hard drive, 14ms		➤ **850MB** local bus IDE hard drive, 11ms		➤ **1GB** local bus IDE hard drive, 12ms		➤ **1.2GB** local bus IDE hard drive, 10ms	
➤ 3.5" 1.44MB floppy disk drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive	
➤ **Diamond Stealth 64** PCI local bus color video card, 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus color video card, 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus color video card, 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus color video card, 1MB DRAM	
➤ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dp		➤ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dp		➤ **ZEOS 15"** 1024 x 768 NI SVGA color monitor, .28mm dp		➤ **ZEOS 15"** 1024 x 768 NI SVGA color monitor, .28mm dp	
➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans	
➤ Microsoft Mouse		➤ Microsoft Mouse		➤ Microsoft Mouse		➤ Microsoft Mouse	
➤ MS-DOS 6.2, Windows for Workgroups 3.11		➤ MS-DOS 6.2, Windows for Workgroups 3.11		➤ MS-DOS 6.2, Windows for Workgroups 3.11		➤ MS-DOS 6.2, Windows for Workgroups 3.11	
				➤ **Lotus SmartSuite**		➤ **Lotus SmartSuite**	

intel inside

Included With Every ZEOS Pantera:

- ➤ Genuine Intel® Processor. ZIF socket for easy upgrading.
- ➤ Diamond Stealth PCI local bus SVGA color graphics card with 1MB DRAM, upgradable to 2MB DRAM.
- ➤ Flash BIOS for easy upgrading.
- ➤ Two high-speed serial ports and one enhanced parallel port on the motherboard.
- ➤ Slots: Three PCI & 4 ISA (486), 3 PCI & 5 ISA (Pentium).
- ➤ ZEOS 101-key space-saving keyboard.
- ➤ 200 watt power supply with built-in surge suppressor. Switchable between 115/230V.
- ➤ FCC Certified Class B; UL Listed.
- ➤ Complete ZEOS Customer Satisfaction Package.

486 & DX4:
- ➤ RAM expandable to 128MB.
- ➤ EPA Energy Star compliant.

Pentium™ 60:
- ➤ RAM expandable to 384MB.
- ➤ On-board Fast SCSI-2 option.

Pentium™ 75, 90, 100 & 120:
- ➤ RAM expandable to 384MB.
- ➤ On-board PCI local bus Fast SCSI-2 and Ethernet LAN options.
- ➤ EPA Energy Star compliant (75, 90 & 100).

Favorite Options

1GB to 1.2GB Hard Drive Upgrade $95

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Diamond Stealth 64 Video PCI Card with 2MB VRAM $249

Upgrade from a 14" to a 15" Monitor
ZEOS SVGA NI, 1024 x 768, flat screen $95

Upgrade from a 15" to a 17" Monitor
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SCSI Controller Chip
For on-board SCSI. Includes drivers $49

Internal 14,000 bps V.32 bis Modem with 14,400 bps Send/Receive Fax $79

Internal 28,800 bps V.34 bis Modem with 14,400 bps Send/Receive Fax $199

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PCI Ethernet LAN adapter with 10Base5, 10Base2 and 10BaseT connections $199

Front Drive Bay PCMCIA SwapBox
Installs into 3.5" drive bay. 2 Type II, or 1 Type III and 1 Type II $179

350 Internal Tape Backup
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Circle 237 on reader service card

ZEOS Meridian™ Notebooks...

Meridians with unretouched photos of active matrix displays.

Top-Notch Speed Demons.

Vroooom! ZEOS Meridian notebooks are setting the pace—racing through application after application. They're swift and powerful. They're the *Indy*sputable performance champs.

And they just got faster! Added to our already speedy Meridian line is the ZEOS Meridian 850 notebook featuring a Pentium-75 processor.

While each Meridian product is distinct, they all have several hot features that add to their impressive speed and ease of use including local bus video; a comfortable palm rest with an integrated TruePoint pointing device; and an 84-key keyboard.

Meridian 400 Subnotebook

WINDOWS MAGAZINE 1995 WIN 100 May 1995

"ZEOS is out to prove that good things do come in small packages with its Meridian 400C subnotebook," reported *Windows Magazine.*

At 3.9 pounds, the Meridian 400 subnotebook is molded from a special carbon-fiber material that cuts weight and improves durability. And with your choice of a 486DX2-50 or DX4-100 processor, hard drives to 350MB, and RAM that's user upgradable to 20MB, this notebook is "faster than a speeding desktop," as *Computer Shopper* said.

The 400 features active and dual-scan color screen options. You also get two Type II PCMCIA slots and an external ultra-light 3.5" 1.44MB floppy drive (included in Packages 2 and 3).

Meridian 800 Notebook

WINDOWS MAGAZINE 1995 WIN 100 May 1995

"The 800C notebook offers sleek styling, solid construction and hot performance.... one of the fastest notebooks we've ever tested," said *Windows Magazine.*

At 6.3 pounds, the Meridian 800 full-size notebook is light enough to travel anywhere yet it's large enough to use for presentations and everyday computing. And with your choice of a 486DX2-50 or DX4-100 processor, removable hard drives to 528MB, and RAM that's user upgradable to 20MB, this notebook is the raciest thing around.

For your viewing pleasure, the 800 is available with your choice of color displays—a whopping 10.3" dual scan or 9.5" active. You also get two Type II or one Type III PCMCIA slots, and an internal 3.5" 1.44MB floppy drive.

Meridian 850 Pentium™ Notebook

Ultimate horsepower that takes the checkered flag! The Meridian 850 gives you supreme Pentium performance in a bundle weighing only 6.8 pounds. It's light enough to race around the world with you yet it's powerful and fast enough for the most demanding computing.

For turbo power, the Meridian 850 comes with a Pentium-75 processor; 8 or 16MB RAM—user upgradable to 32MB—with 256K synchronous SRAM cache; and removable hard drives to 810MB. For the best viewing, the 850 is available with your choice of color displays—

Purchase orders are subject to approval. Business leasing programs available. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. The Energy Star emblem does not represent trademark of Micron Electronics, Inc. (c) 1995 MEI. ZEOS International, 1301 Industrial Blvd., Minneapolis, MN 55413 USA. Micron Electronics, Inc. is a publicly traded company (NASDAQ symbol: MUEI).

a mammoth 10.3" (800 x 600) dual scan or 9.5" active matrix. You also get 16-bit stereo sound through audio jacks (Sound Blaster Pro compatible) for the best in portable multimedia, two Type II or one Type III PCMCIA slots, and an internal 3.5" 1.44MB floppy drive.

Buy With Confidence

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486 & DX4

Package 1			Package 2			Package 3		
Dual Color	**400C**	**800C**	**Dual Color**	**400C**	**800C**	**Dual Color**	**400C**	**800C**
486DX2-50	**$1995**	**$2195**	**486DX2-50**	**$2295**	**$2395**	**486DX2-50**	CN! **$2595**	CN! **$2695**
DX4-100	**$2395**	**$2595**	**DX4-100**	**$2695**	**$2795**	**DX4-100**	CN! **$2995**	CN! **$3095**
Active Color	**400A**	**800A**	**Active Color**	**400A**	**800A**	**Active Color**	**400A**	**800A**
486DX2-50	**$2695**	**$2995**	**486DX2-50**	CN! **$2995**	**$3195**	**486DX2-50**	CN! **$3295**	CN! **$3495**
DX4-100	**$3095**	**$3395**	**DX4-100**	CN! **$3395**	CN! **$3595**	**DX4-100**	CN! **$3695**	CN! **$3895**
➤ 4MB RAM ➤ 260MB IDE hard drive ➤ 800: Internal 3.5" 1.44MB floppy drive ➤ MS-DOS 6.2			➤ 8MB RAM ➤ 350MB IDE hard drive ➤ 3.5" 1.44MB floppy drive. 400: External, 800: Internal ➤ Custom nylon carrying case ➤ MS-DOS 6.2, Windows for Workgroups 3.11 ➤ Lotus Organizer			➤ 8MB RAM ➤ 350MB IDE hard drive (400), 528MB IDE hard drive (800) ➤ 3.5" 1.44MB floppy drive. 400: External, 800: Internal ➤ **14.4 PCMCIA fax/modem** ➤ Custom carrying case. 400: Leather, 800: Nylon ➤ Extra battery ➤ MS-DOS 6.2, Windows for Workgroups 3.11 ➤ Lotus Organizer		

Pentium

Package 1		Package 2		Package 3	
Dual Color	**850C**	**Dual Color**	**850C**	**Dual Color**	**850C**
Pentium-75	**$3495**	**Pentium-75**	CN! **$3995**	**Pentium-75**	**$4395**
Active Color	**850A**	**Active Color**	**850A**	**Active Color**	**850A**
Pentium-75	**$4295**	**Pentium-75**	**$4795**	**Pentium-75**	**$5195**
➤ 8MB RAM, 256K synchronous SRAM cache ➤ 528MB IDE hard drive ➤ Internal 3.5" 1.44MB floppy drive ➤ Integrated 16-bit stereo sound ➤ MS-DOS 6.2, Windows for Workgroups 3.11		➤ 16MB RAM, 256K synchronous SRAM cache ➤ 528MB IDE hard drive ➤ Internal 3.5" 1.44MB floppy drive ➤ Integrated 16-bit stereo sound ➤ Custom nylon carrying case ➤ Extra battery ➤ MS-DOS 6.2, Windows for Workgroups 3.11 ➤ Lotus Organizer		➤ 16MB RAM, 256K synchronous SRAM cache ➤ **810MB** IDE hard drive ➤ Internal 3.5" 1.44MB floppy drive ➤ Integrated 16-bit stereo sound ➤ **14.4 PCMCIA fax/modem** ➤ Custom nylon carrying case ➤ Extra battery ➤ MS-DOS 6.2, Windows for Workgroups 3.11 ➤ Lotus Organizer	

Included With Every ZEOS Meridian:

- ➤ 400 & 800: Intel® 486DX2-50 or DX4-100 processor. 850: Intel® Pentium-75 processor.
- ➤ RAM expandable to 20MB (850 to 32MB).
- ➤ 400: IDE HDD upgradable to 350MB. 800: IDE HDD upgradable to 528MB. 850: IDE HDD upgradable to 810MB.
- ➤ Local bus video with 1MB video RAM.
- ➤ PCMCIA slots. 400: 2 Type II, 800 & 850: 2 Type II or 1 Type III.
- ➤ Display: Color VGA backlit LCD, up to 256 colors. 400: 640 x 480 7.9" DSTN or active matrix. 800: 640 x 480 10.3" DSTN or 9.5" active matrix. 850: 10.3" **800 x 600** DSTN or 9.5" 640 x 480 active matrix.
- ➤ Supports an external SVGA color monitor at resolutions up to 1024 x 768.
- ➤ 84-key keyboard with embedded numeric keypad, 12 dedicated function keys and inverted "T" arrow keys. Integrated TruePoint pointing device.
- ➤ Ports: Serial, parallel (850: enhanced EPP & ECP), external VGA video, external keyboard or PS/2 mouse (800 & 850 both). 400 also with external floppy drive. 850 also with mic-in and stereo speaker-out.
- ➤ Replaceable, rechargeable NiMH battery.
- ➤ Full power management features.
- ➤ AC110-240V to DC adapter.
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- ➤ EPA Energy Star compliant.
- ➤ FCC Certified Class B; UL Listed.
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- 17" SVGA color monitor
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- MS-DOS, Windows for Workgroups, Microsoft Mouse
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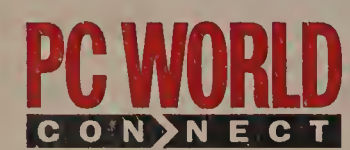

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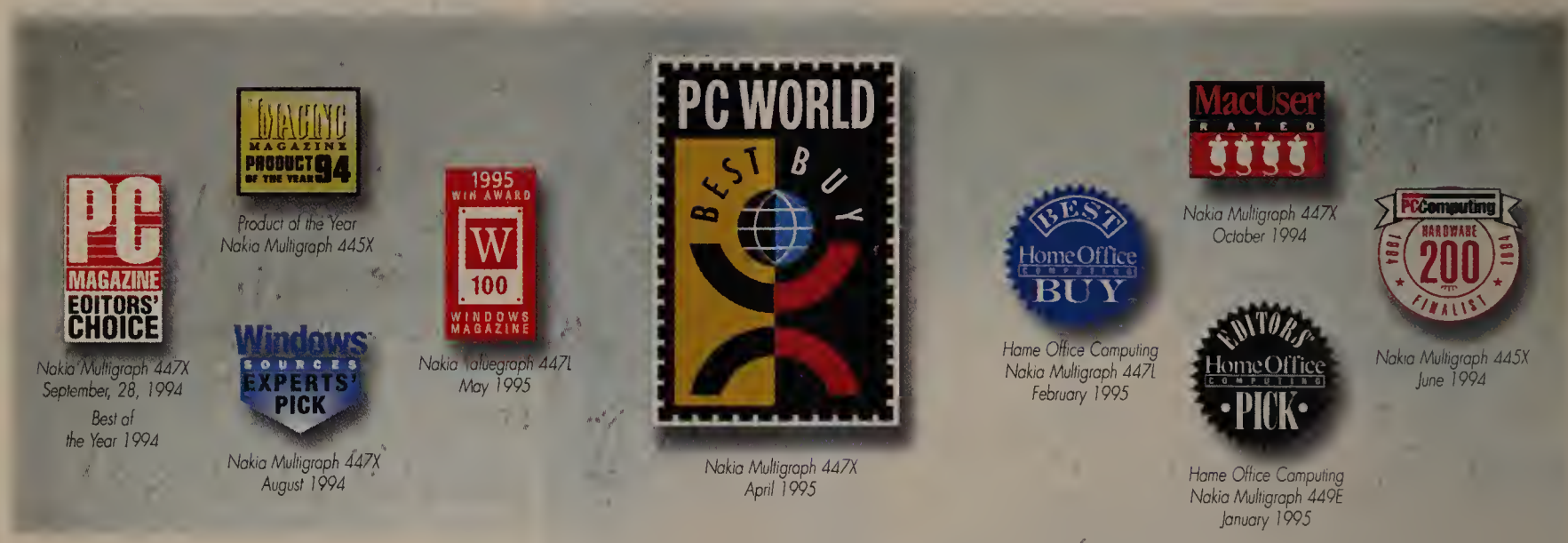

The Nokia 447X has just been named a Best Buy by *PC World*. This adds to a long and growing list of awards and honors for Nokia monitors.

Ever since their introduction in the U.S., Nokia has been recognized by editors and sophisticated users alike as technologically superior. The displays are brilliant and tack-sharp. The ergonomics are an exuberant expression of Nokia's European home.

Nokia "firsts" read like a history of advanced monitor technology; including the world's first TCO and MPR II-certified emissions control and the first all digital monitors with on-screen menu controls.

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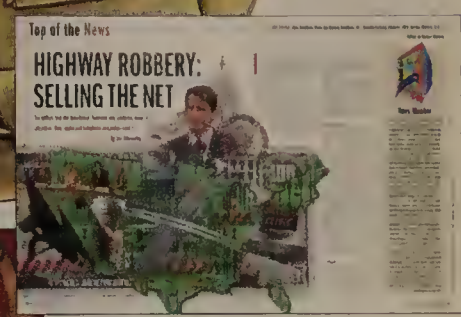
Seeking Gold...and Finding Some

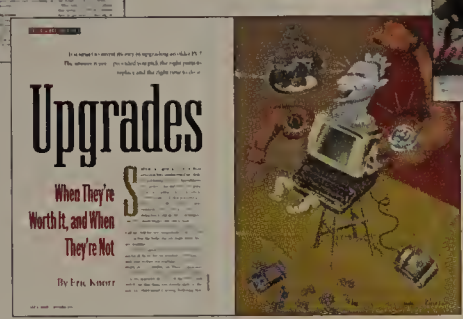
When you buy a PC or software, you want to buy from a company you can trust—one that puts as much energy into solving problems of existing customers as attracting new customers. In "PC Reliability and Service: Boom and Bust?" authors Daniel Tynan and Mike Hogan and editor Roberta Furger condense the experiences of thousands of *PC World* readers into reliability-and-service rankings that are your best guide to how PC companies treat their customers.

Unlike other rankings that ask respondents only to rate their satisfaction with reliability and service, *PC World*'s findings are based on a straightforward questionnaire that asks readers whether they have ever had a problem with their PC, what the problem was, and how it was resolved. The former approach, we discovered, skews company ratings because people expect more from some brands and less from others. Our ranking of companies from best to worst also leaves no doubt about how companies compare.

Not that this approach is painless. Although many computer magazines claim to give readers all the "buying information" they need, few cover reliability and service at all, and those that do so appear determined to submerge distinctions rather than to illuminate them. It's easy to understand why: No editor enjoys fielding angry phone calls from companies that rank at the bottom. And a few angry calls do come in. Some callers challenge the validity of our approach, although they reconsider when they hear about the random-sample surveys that validate the vast data we gather. But the angriest calls come from a handful of companies that believe that the sole job of computer magazines is to praise computers. One outraged executive told me, "[Computer magazine X] doesn't publish articles like this. It isn't good for their advertisers!"

If angry phone calls and occasional lost advertising revenue are the price of responsible journalism, the Jesse H. Neal Editorial Achievement Awards are one of its great compensations. "Your New PC: DOA or Destined for Glory?"—the June 1994 *PC World* reliability-and-service article that inspired the angry call described above—won the American Business Press's Neal Award as the year's best single article. Now in their 41st year, the Neal Awards rank among America's significant journalistic prizes. When 758 entries had passed the scrutiny of numerous screening panels and a final decision by ten distinguished judges, *PC World* became the first computer or electronics publication whose editors had ever won three Neal Awards in a single year.





Our Neal Award winners: "Your New PC: DOA or Destined for Glory?"; "Upgrades: When They're Worth It, When They're Not"; "Highway Robbery: Selling the Net." Congratulations to PC World's Joe Abernathy, Barbara Adamson, Anita Amirrezvani, Cathryn Baskin, Jeff Berlin, Steve Fox, Roberta Furger, Russell Glitman, Laura Guerin, Robert Kanes, Eric Knorr, Dan Miller, Daniel Tynan, and Christina Wood.

The Neal Award for best how-to article went to "Upgrades: When They're Worth It, and When They're Not," November 1994. Like this month's Top 20 PCs review and our roundups of fax-modems and communications software, the award-winning upgrades feature drew upon the strengths of the PC World Test Center to determine which products deliver sufficient benefit for the cost.

Capturing the Neal for best investigative article was May 1994's "Highway Robbery: Selling the Net," which identified the politicians getting donations to help them draw up the information highway road map. This time the cries of protest reached our ears from Capitol Hill, where some officials would rather you didn't know who pays their campaign bills.

Having revealed who is footing the bill for the Internet (and who has the most to gain from it), we decided it was time to provide hands-on advice for getting connected. So in this issue, we take a look at what's available in communications tools and online content, rating Internet Web browsers as well as the major commercial online services.

Phil Lemmons

Phil Lemmons, Editor in Chief

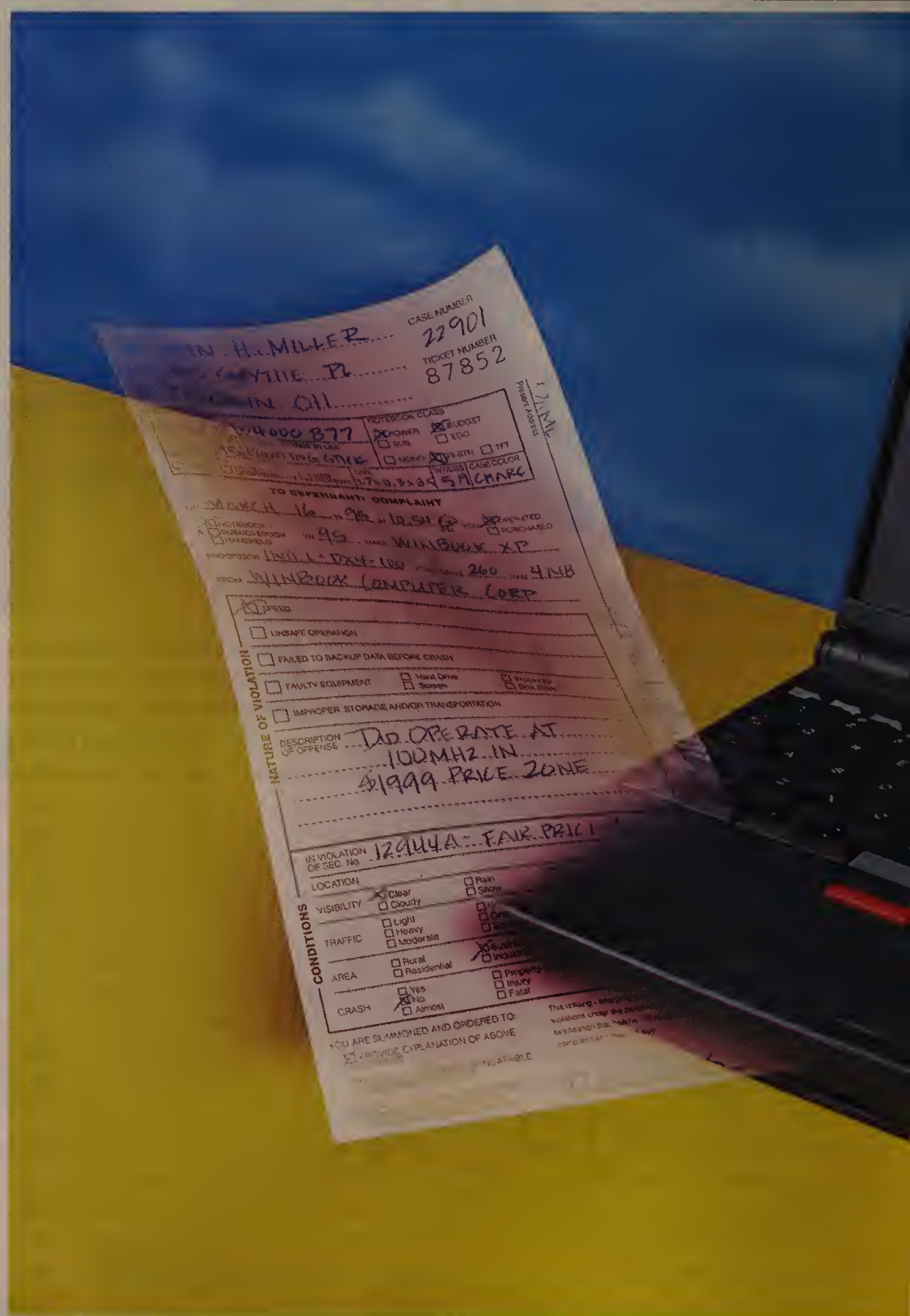
AT $1999, IT'S THE TICKET YOU'LL

The WinBook XP breaks another price and quality barrier. For $1999 you get 100MHz of speed and power in the award-winning, ergonomically-designed notebook that has all of the critics raving.

The 32-bit local bus video Rocketchip accelerator boosts your graphics performance level and a ten-cell NiMH battery pack keeps the power going. Ergonomic features include a sloping wrist rest, full-size keys and your choice of pointing devices—the standard dual-button pointing stick, or an additional trackball or touchpad as an option. An LCD indicator let you monitor functions at a glance.

Components are upgradable—RAM to 32MB and removable hard drives with capacities to 810MB. Plus PCMCIA capabilities give you even more flexibility. Options include a 14.4 send/receive fax/voice/data modem, internal audio and docking station.

The WinBook XP has a configuration to meet your budget and system requirements. Call one of our WinBook representatives toll-free today to order your WinBook XP or to receive your free notebook information buying packet—complete with the latest reviews of our products, pricing and accessories.



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I give them computers.

And networks.

Peripherals.

And software.

I seek solutions.

Without creating new problems.

I take time to choose wisely.

And find ways to save time.

I know what to look for.

It looks like this.

2 in a series

The Mac OS Advantage

The Mac™ OS. It's the operating system that helped make the Macintosh® famous. It helps people do more in less time. In fact, according to an Arthur D. Little study, people using the Mac OS are 44% more productive than those who use Windows.* It's also a great way to get the power of RISC on a desktop PC.

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Circle 16 on reader service card

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Indecent Legislation, Power to the Home User

Freedom of Bits and Bytes

I was disturbed to read that the proposed Communications Decency Act could penalize providers of communications networks such as Internet services for improper use of those technologies by individuals ["Feds Target the Internet," *Top of the News*, May].

This crusade to "keep the information highway from resembling a red-light district" could crush entrepreneurs' desire to operate a BBS, network, or online service. Why risk being held responsible for individuals abusing the system to transmit obscene or threatening material?

I haven't heard anyone complain about the role of phone companies in such transmissions. What about the U.S. Postal Service, which transports adult magazines and videos daily?

Some people just don't get it.
Oriel Mor, CompuServe

Hard Drive Review On Target

I was impressed by "Cheaper by the Gigabyte" [March]. So many articles on hard drives either leave out SCSI drives entirely or give them short shrift because the author doesn't understand the performance trade-offs of SCSI compared to IDE.

I was also pleased that your tables included such information as rotation rate, mode handling, and drive cache. Such criteria can have a big impact on performance, and most reviews do not take these factors into account.

Thank you for a job well done.
Jim Beveridge,
Burlington, Massachusetts

Rough Justice

If all you Microsoft-bashers put on a semblance of principles and divested yourselves of Microsoft and Gates contributions to the computer world, the rest of us could watch you huddle in a corner with your beads and sandals trying to learn to count rocks.
M. W. Brawn, Hebron, New Hampshire

What Do Home Users Really Want?

Here comes a small voice from the wilderness. I use a PC at home to extend my capabilities and make my life as simple as possible in a crazed information age. I am not a corporation; nor do I run a business from my home.

There are no magazines for people like me. But I have news for the industry: The big bucks are in the home. Do they really want to sell us a computer? Then maybe they should give us what we want.

Where did the industry get the idea we want weaker systems in the home? So far, home PCs are not powerful enough. A truly useful one would allow us to get information and services we can't get now, by accessing the world beyond our little local wasteland. That's what we want: freedom. Not word processors and check writers. Let me make art. Let me make music. Let me program software. Now that's a home computer.
R. Scott Semken, Espoo, Finland

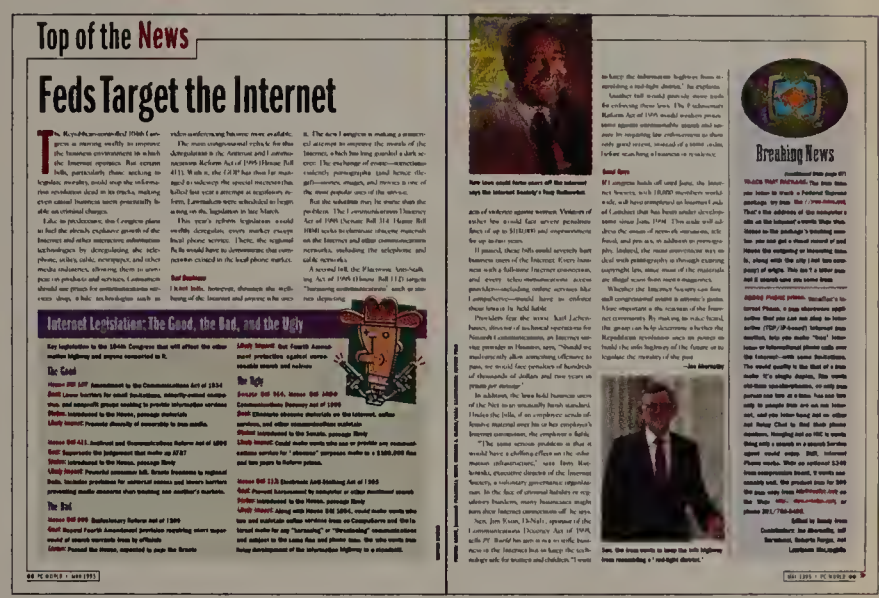
Hot Tip

I've had trouble for a couple years with CD-ROM programs that refused to run properly. I tried to solve the problem many ways but finally gave up. Then I stumbled across March's *Tip of the Month*. Once I modified my autoexec.bat file as described, my programs ran fine. The tip paid for my subscription many times over.
Robert Swartz, Englewood, Colorado

Kill the Cover Story

Enough! *Fini! Genug!* I've had it with Windows 9*x* coverage. I hereby declare a moratorium on cover stories regarding this constantly postponed, overhyped piece of in-your-faceware until it can be discussed in the present tense.
Tom Zebovitz, Colonia, New Jersey

Editor's response: You'll want to skip this month's *Top of the News* story on the final beta of Windows 95.


Top of the News

Feds Target the Internet

Internet Legislation: The Good, the Bad, and the Ugly

Breaking News

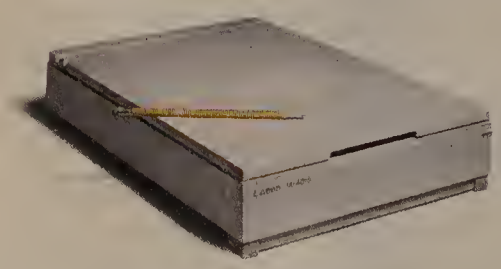
Invaders on the Desktop

Microsoft Network is one more blow to computer privacy. As February's *Top of the News* article "Going Online With Windows 95" states, "Most software upgrades to the service will take place online."

Once upon a time, before Prodigy and America Online existed, a user communicated with a host via a third-party program such as PCTalk or ProComm. Despite relatively primitive interfaces, this method had advantages: privacy and security. The host could only transmit and receive; it could not execute files it transmitted.

This is not true of services that provide communications software and transmit unsolicited modifications to it, which they can execute. They have

The Canon Color Scanner. that's *really* just an



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control of your system when you are online. They can find out what word processor you use and whether you have a CD-ROM; conceivably, they could sell this information along with your name and address. There is also the risk of wiping out your system accidentally. For this intrusion into your machine, you pay them!
Earl M. Kenvin, CompuServe

Coverage Coup

I don't expect your magazine and the rest of the computer press to have the same relationship to the computer industry that the general press does to the government. But nor do I want *PC World* to be an extension of the public relations departments of major vendors. Candidly, I think you are often closer to the latter than to the former. Thus I was heartened to read your coverage of the problems in the floating-point unit of the Pentium processor ["Pentium Flaw: A Wake-Up Call?" in *Top of the News*, March].

You answered all my questions, but I remain unswayed. In the near term, my next system won't be a Pentium, partly because of the way Intel handled the situation.

You have done Intel a service in covering the problem. At least now consumers know what they're dealing with and can make informed choices. I'm sure many who might have hesitated to buy a Pentium will buy one now that they know the facts. Your thorough coverage has garnered at least one more subscription renewal.
Robert E. Butts, South Bend, Indiana

What's WITS?

To me the most interesting part of *Top Ten Accelerators* isn't the video cards but the mysterious WITS benchmark used to compare them. I find it fascinating that no information is provided about WITS other than who developed it.
Jeff Church, Internet

Editor's response: The Windows Integrated Test Suite consists of tests run on boards installed in our 486DX2-66 test-bed system, using the six market-leading applications shown on the Top 10 chart. In each app, we run a series of scripted, graphics-intensive tasks and determine how much faster our test bed is than a baseline 386DX-25. A score of 13.8 in WinWord, for example, means a board makes our test bed run 13.8 times faster than the baseline system. Faster accelerators yield higher scores. —*Michael Desmond*

UPS Waits for No Computer

In "Let's Make a Deal" [March], you advise readers, "If you can't pay by credit, order COD, then set up the machine and test it before you open your wallet—even if UPS is waiting at the door. That way you'll know you didn't spend good money for a dead PC."

Do you people at *PC World* wear rose-colored glasses? Do you really believe a UPS person is going to wait around while a computer is set up and tested?
Alan Siegel, East Greenbush, New York

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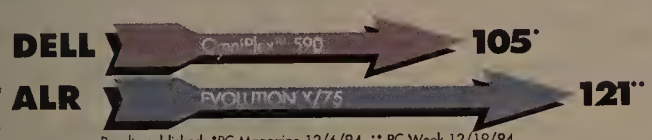
Winstone 95
Higher Score is Better
Winstone 95 Ver 1.0 tests to measure the machines' performance when running typical Windows applications.



Results published: *PC Magazine 12/6/94, ** PC Week 12/19/94

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Complementing this advanced CPU architecture is one of the most advanced implementations of PCI local bus technology available today. The EVOLUTION X/75 comes equipped with an enhanced Mode 3 PCI/IDE interface, providing up to 300% better disk performance than systems using standard IDE technology. It even supports future 8.4-GB IDE drives. And thanks to our dual channel IDE implementation, the ALR EVOLUTION X/75 supports up to four IDE devices. That's enough support for an ALR IDE CD-ROM drive, two hard drives and a removable storage device.

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I Want My 16 Pages Back!

Okay, so you thought we wouldn't notice the March issue is a full ⅛ inch smaller in both dimensions, right? My calculations, based on 328 pages, say that pre–March 1995 *PC World* measured 28,536 square inches. As of March 1995 it measures 27,121.5 square inches.

That's a total loss of 1414.5 square inches per issue, or, at the original 87 square inches per page, a loss of 16.25862 pages per issue!

Are you trying to save paper, postage, money, or all three?

Ed Igoe, Internet

Senior production manager's response: We cut the trim size by 5 percent to help offset increased costs to distribute and print the magazine. The cost of paper (our largest production expense) has gone up about 30 percent since September. The increase was driven by greater demand for paper worldwide and huge raw material price increases in the pulp industry. In January the U.S. Postal Service also increased the cost to mail second-class material by 13 percent. —*Nadia Maudsley*

Corrections and Clarifications

A few readers have queried how to access the Online Career Center mentioned in December's *Real Problems, Real Solutions* ("Netting a Job"). Bruce Brazell used an Internet gateway via T-Net, an online service that's exclusively for teachers. Most online services provide such gateways; it's easiest to access the Internet's Career Database through a service like CompuServe (**go espan** for E-Span's 2000-listing job database) or America Online (keyword **careers**). To locate other job resources on the Net, you'll need help. Try Joyce Lain Kennedy's *Hook Up, Get Hired* (John Wiley & Sons, 212/850-6000) or James Gonyea's *The On-Line Job Search Companion* (McGraw-Hill, 617/262-1160).

"A New Spin on Removable Hard Drives" (April, *New Products*) stated that Iomega planned to release a 200MB cartridge for its Zip drive. Iomega now says it will continue to produce only the 100MB ones.

April's *Online* stated that America Online charges $3.50 for each additional hour beyond the 5 hours covered by AOL's monthly charge of $9.95; AOL has since reduced the extra-hours charge to $2.95 per hour.

In May's "Software for Next to Nothing," we inadvertently failed to credit artist Robert Zimmerman for creating the illustrations that were featured throughout the story.

The captions for the photographs of the Sycom VIP 9000 Plus and the Voice It Personal Note Recorder that appear on page 94 of *New Products*, May, were swapped by mistake.

May's "Top 20 PCs: 100-MHz Face-Off" mistakenly stated that Epson has no turnaround repair policy for notebooks. Epson says the company will replace problematic units by the next business day at no additional cost.

PC World regrets the errors.

Letters *welcomes your responses and ideas.* *See page 12 for contact information.*

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Who's Who of Windows 3.1

Want to see the credits for Windows 3.1? In Program Manager, select Help • About Program Manager, hold down <Ctrl>-<Shift>, and double-click the Windows icon in the upper left corner of the dialog box. Close the box, repeat the steps, and you'll see a waving flag with a message. Repeat the steps again to see a scrolling list of credits on a chalkboard with a man or bear pointing to it. This procedure works for many of the information dialog boxes in standard Windows applications and accessories such as Cardfile and Calculator.

Charles Forelle
New York

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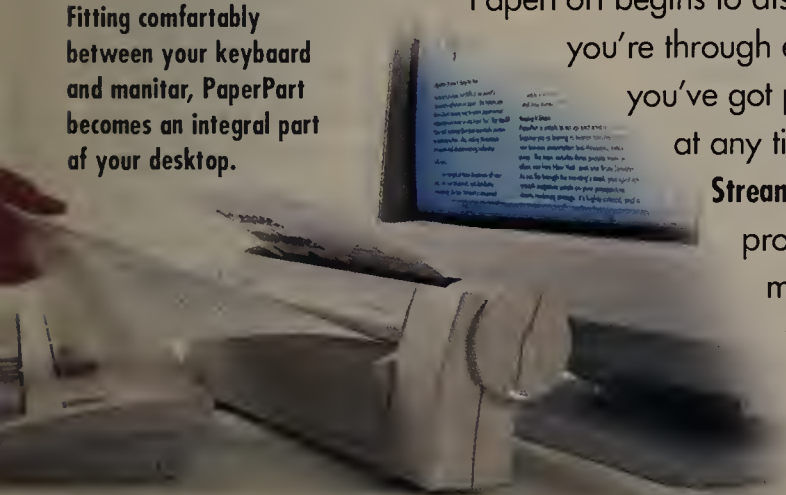

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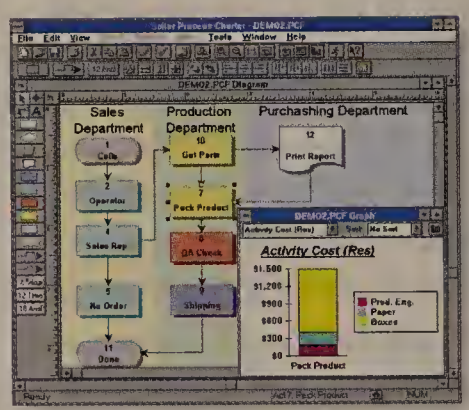

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†PC Week, Nov. 21, 1994

Taking (Some of) the Mystery out of CD Shopping

My kids knew the exact day that the *Lion King* video roared into stores. Word of its arrival spread like wildfire through their school, and by the time I came to pick them up, they'd planned the entire evening: First to the store to pick up our copy, then home for a nice, quiet meal in front of the TV.

We compromised. I agreed to stop by the store on the way home; they agreed to wait until *after* dinner to watch the movie. I'd already decided this one was a keeper. We'd seen the movie twice in the theater and had listened to the sound track so many times that even our neighbors were humming "Hakuna Matata."

Whether your tastes lean toward Simba and his pals or toward decidedly edgier heroes like Clint Eastwood and Tommy Lee Jones, chances are you've previewed every movie you've added to your home video library—or for that matter, every addition you've made to your LP and audio CD collection.

Wouldn't it be great if you could try out CD-ROM titles before buying them? If only you didn't have to worry about whether your $40 purchase would hang your computer—or that it would wind up gathering dust on a shelf somewhere.

No doubt the thousands of disappointed families that bought the *other* Lion King—the bug-ridden CD-ROM game that Disney released last December—wished they'd had a chance to check out the title ahead of time (like maybe when their kids were in bed, rather than hovering anxiously around the computer).

By Roberta Furger

The Moment of Truth

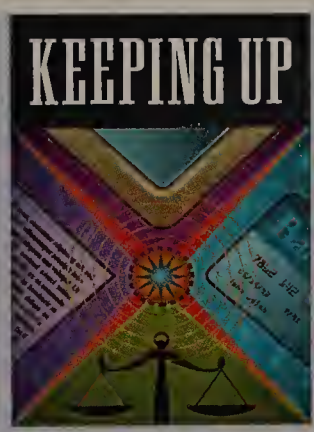
Even if you read the reviews and ask friends for recommendations, you don't know what you're getting until you slide the disc into the CD-ROM drive. That's why as many as 40 percent of all CD-ROM titles get returned, says Michael Moon, director of executive programs at Gistics, a research and consulting firm in Larkspur, California. "You've only got a fifty-fifty chance that it'll run the first time," he adds.

With odds like that, it's no surprise that a growing number of retailers and entertainment CD-ROM publishers are realizing that the more informed consumers are before they buy a CD, the better the chance they'll keep it. That's where two trends come in, both designed to take some of the mystery out of CD-ROM shopping by giving multimedia-hungry consumers an opportunity to "taste-test" new titles before buying them.

Several national chains, among them CompUSA, Imaginarium, The Learning Smith, and Toys "R" Us, are installing demonstration stations in some stores—Windows and Macintosh computers preloaded with a variety of fully functional CD titles for customers to preview. The scope of these enterprises varies considerably, ranging from as few as two or three computers with just a handful of products to as many as eight PCs and Macs with access to hundreds of entertainment titles.

CompUSA's demo strategy is by far the most aggressive. It consists of two sections: CompKids, where children can play with hundreds of software packages and CD titles; and Software Sampler, which includes hundreds of titles for the over-14 crowd. Right now, only seven stores have the demonstration areas, but the Dallas-based chain hopes to roll out the program in more locations, according to CompUSA public relations manager Laurie Levy.

The demo concept sounds good, but it isn't without problems. You can test only the software or CD titles that the store has preselected and preloaded on its computers. That means, for example, if Encarta is featured, and you want to check out Compton's and Grolier's as well, you're out of luck. Except for CompUSA, most stores typically have around 20 products available for preview. The areas are frequently



In a landmark decision this past March, a jury in Hastings, Minnesota, decided that IBM and Apple were not obligated to provide "warnings or instructions for safe use" of their keyboards, and that the companies did not "fail to use reasonable care" in the design of their keyboards, which were alleged to cause repetitive strain injuries...In February, Drake International (aka Gamma Systems), a mail-order PC company in Tempe, Arizona, ceased operations and filed Chapter 7 in U.S. Bankruptcy Court in Phoenix (file no. 95-00953). Former customers who want to file a claim against Drake should call 602/640-5800, select the filing-information option, then select the creditors-information option...Setting an example for bureaucracies nationwide, the state of Massachusetts now has a Consumer Affairs World Wide Web page, which includes electronic inquiry and complaint forms and information on a wide variety of consumer issues. The address is http://www.consumer.com/consumer.

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U.S. Robotics Sportster V.FC and V.34 modems

Bug: **Early versions of U.S. Robotics' Sportster V.FC and V.34 modems drop connections unexpectedly under certain line conditions. The company says incompatibilities in the V.fc protocol's retraining sequences cause the problem, but other U.S. Robotics modems aren't affected. To determine whether your Sportster is prone to the carrier-drop problem, call U.S. Robotics' technical support department. Or start your communications application and issue the command ATI7 in the terminal window. Your modem will respond with several lines of information, including a 'Supervisor date'. Modems with the carrier-drop problem display Supervisor dates earlier than 11/30/94.**

Fix: **U.S. Robotics has released a revised free e-prom chip upgrade that corrects the problem. You can order it by contacting technical support. The company sends the chip, instructions for opening the case for external units, and a chip puller for removing the old e-prom (which you can discard or make into an earring). The company offers no other assistance for replacing the chip. Instead of making the e-prom fix, Sportster V.FC owners may opt to purchase a $29 e-prom upgrade and get the more complete V.34 28.8-kbps protocol. Contact tech support (708/982-5151) to order the upgrade.**

—Scott Spanbauer

Scott Spanbauer is a contributing editor for PC World. Have you run into a software bug or hardware incompatibility? Call us at 415/978-3253 with the details. We'll investigate problems and report on those with the broadest interest. Due to the volume of queries, we may not be able to return your call, and we cannot provide technical support.

crowded, so unless you go during off-hours, be prepared to keep your test drive short. (To keep crowds down, CompUSA imposes a 4-minute time limit on the Software Sampler—the program boots you out when your time expires.)

Though the demo stations are a hit with customers, it's not clear whether people are actually *buying* the software they try out, says Laura Curran, director of research at Merrin Information Services in Palo Alto, California. "The jury is still out on that way of showing software. You can't evaluate a product as well in a store as you can at home. You need time," she says.

Gistics' Moon agrees that a store isn't the best place to try new software. Even if you can take your time testing a product, you're still left with the question of whether or not it's going to work on *your* computer.

That's where rentals come in. Though these programs are still in their infancy (according to one estimate, about 1000 outlets nationwide rent DOS, Windows, and Macintosh CD titles), Moon and others believe a healthy rental market is what's needed to drive CD-ROM sales. Case in point: Four out of five Sega and Nintendo game titles purchased at Toys "R" Us had been rented first. It makes sense. At around $40 to $50 apiece, game cartridges aren't cheap. It's well worth a rental fee to make sure you like it before you buy it.

Blockbuster Video received national attention last year when it introduced a pilot rental program in several San Francisco Bay Area stores. The company has since extended the test to selected sites across the country. On the East Coast, the Stop and Shop grocery chain has been renting CD-ROMs since the end of 1993. Several other smaller outlets have also set up rental programs, encouraged both by the booming consumer market and by the dearth of new games in the Sega-Nintendo arena, says David Balfour, multimedia marketing manager for Ingram Entertainment. The La Vergne, Tennessee, company is one of a handful of distributors that are working with video and grocery stores to expand the market for CD-ROM rentals.

Balfour is bullish on the concept but admits that we're a long way from being able to drive to the corner store and pick out a couple of CD-ROMs on a Friday night. One of the biggest hurdles is support. Many software companies have stayed away from the rental market, in part out of fear that they'll be flooded with calls from rental customers needing help with their products. Support questions proved to be a problem at Blockbuster, which wound up having to set up its own technical support line to deal with frustrated customers.

Another thorny issue: Most stores don't have shelf space to stock dozens, let alone hundreds, of CD-ROM titles. So the pickings may be slim. The hottest items, according to Balfour, are games from companies like Interplay, Virgin Games, and Mindscape. What you won't see a lot of are entertainment titles or kids' products. "Most of the customers are adult males from 18 to 50," says Balfour. "Until that broadens, we won't be able to sign up many 'edutainment' companies. It's a chicken-and-egg kind of thing."

Fix the Popcorn, I'm Ready to Play

CD-ROM rentals typically cost $4 for two nights—not a bad deal, especially if it saves you from spending $40 on a title that won't get much use. In fact, Balfour admits that some software publishers are staying out of the rental market for fear it'll cannibalize sales. That's probably true for the CD-ROMs that aren't worth buying in the first place—but for the really great titles, a weekend rental will quickly turn into a sale.

Just as with your favorite video, you'll want to play it over and over and over...

Shop Talk

Gone With the Goods

On December 30, 1994, I responded to a full-page advertisement in *PC World* for International Upgrade Source. The company was offering to

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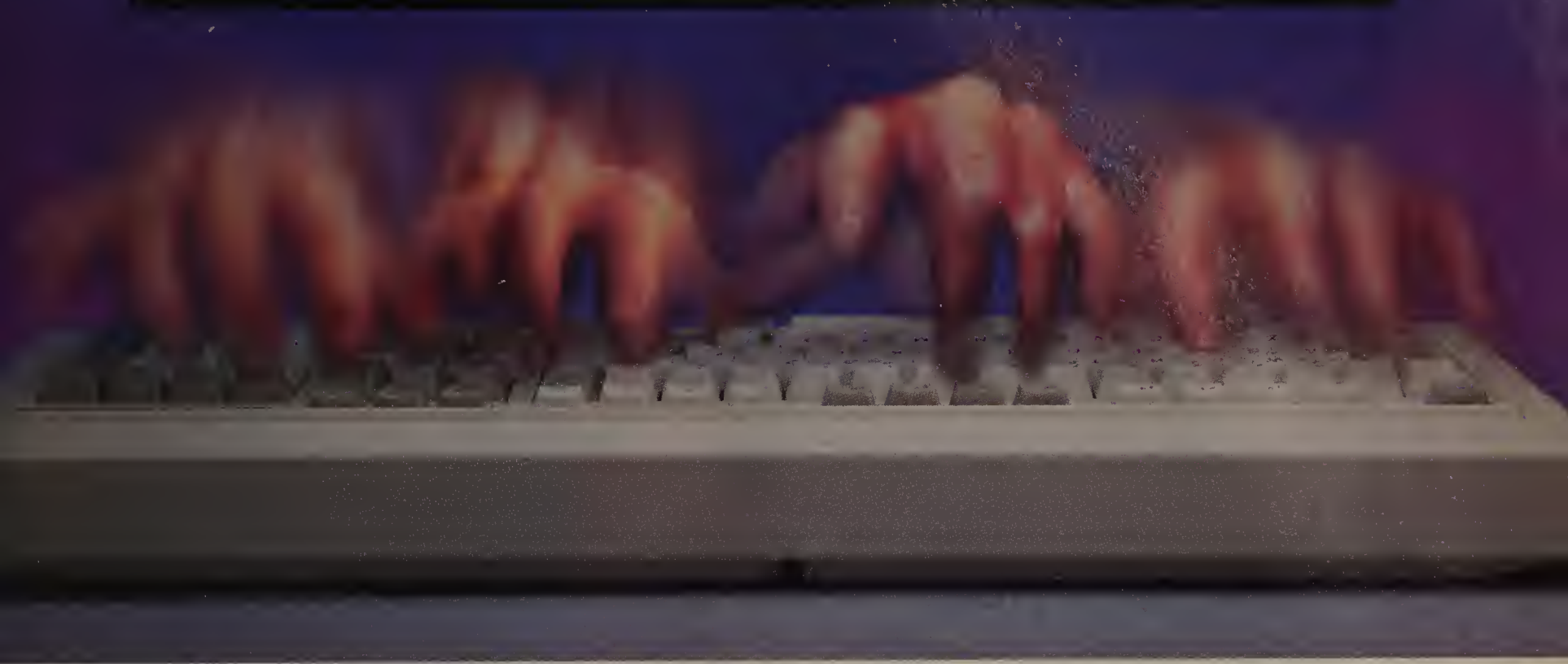

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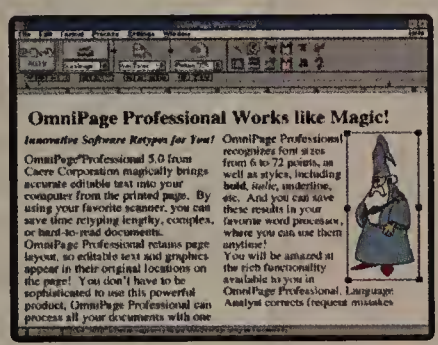

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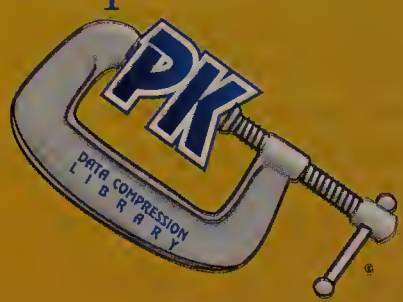

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buy computer memory chips from people who had upgraded and wanted to get rid of their old chips. A representative told me the company would pay me $100 if I mailed in my memory chip. I did. I sent it via registered mail and got a receipt from the post office proving the company had received my shipment.

Since then I have called many times. At first I was given excuses like, "We're cutting your check by the end of the week," or, "We recently fired our bookkeeper so we're a bit behind." Two months after the fact, I haven't been paid. Lately they've stopped answering the phone altogether. Has this company gone out of business?
Steven Henz, St. Louis

Editor's note: *Consumer Watch* has received several letters and dozens of phone calls from people who sent either money or goods to this company and got nothing in return. One reader reported that a staff member at International Upgrade Source laughed and hung up when he asked for his money. According to several sources, the company no longer occupies its place of business in Costa Mesa, California. We were unable to locate any of the principals in the company. But we do know they are being investigated by the Costa Mesa Police Department.

According to Laurel Pallock of the consumer protection unit in the San Francisco district attorney's office, it's difficult to protect yourself from this kind of crime. "Dealing with any company not in your physical locale leaves you wide open for problems," she says. But most counties have a consumer protection organization. Generally, it's located in a city office such as the district attorney's or mayor's office.

Any time you have a serious problem with a company, file a report with the consumer protection unit where the company was doing business. If it's a mail-order company, report it to the postal inspector in your own city. Hold on to copies of ads and any receipts you may have. If you paid with a credit card, you will be in much better shape. Contact your credit card company for assistance. Unfortunately, reporting the company won't necessarily get your money back. But it will notify these agencies of the problem, along with the law

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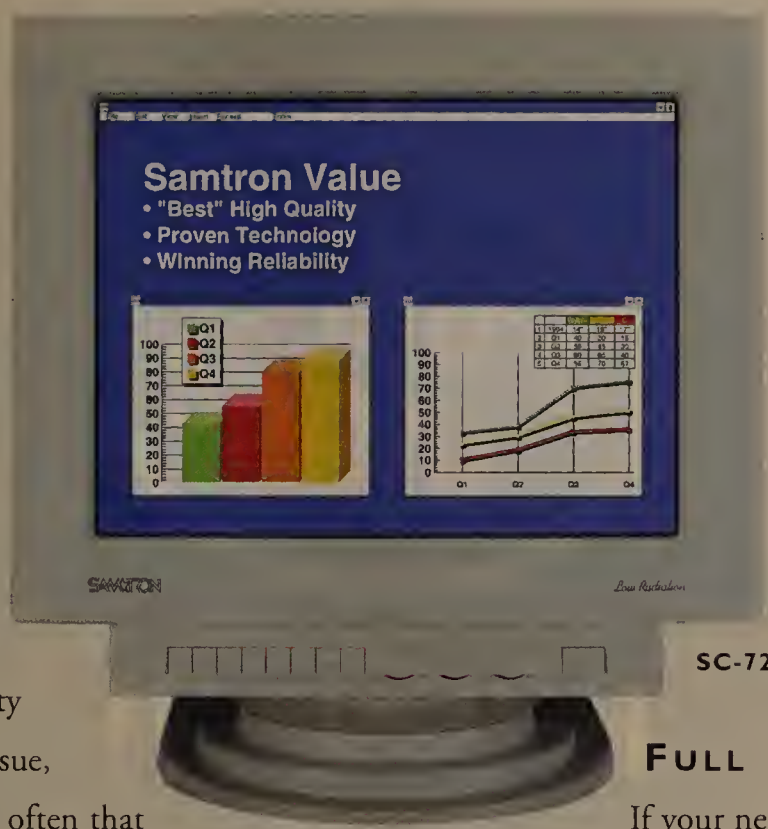

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enforcement departments they report to, and that may make justice easier to serve.

"Once a company goes belly-up, it's very hard to track them," says Pallock. "Your only option is to band together with others who have lost money, hire a lawyer, and go after them." Whether this approach is worthwhile depends on how much you've lost. We'll continue to investigate International Upgrade Source and will report what we find. If you have information about the company, please contact *Consumer Watch*.

As If Taxes Aren't Enough

Editor's note: By now you've probably read about the problems Intuit had with TurboTax for the 1994 tax year. TurboTax customers faced not only Uncle Sam's outstretched hand but also frustrating shipping delays on the final version of their tax software, endlessly busy phone lines at Intuit, and dangerous bugs in the program.

Intuit responded by posting press releases on online services and holding press conferences. According to those announcements: The shipping problem was caused by problems in the company's order-entry system. The busy phone lines were caused by customers calling to check on their orders. And the bugs affected only about 1 percent of customers. The company posted a corrected version of the software on online services for all users to download. And Intuit president Scott Cook publicly reminded consumers that "our guarantee states we will pay absolutely any IRS penalty caused by a calculation error in either TurboTax or MacInTax."

However, a tax accountant we talked to (who asked to remain anonymous) thought the bugs could affect much more than 1 percent of customers. Your return will be affected by the bugs, according to Intuit, if you reported disability income on Form 1099-R; reported taxable tips on Form 4137; depreciated or took a Section 179 deduction for a vehicle or other asset; depreciated or amortized an asset in the final year of its life; depreciated or amortized any asset, other than a building, used in a rental activity; prepared quarterly estimated taxes and had short-term capital gains in 1994; or imported capital gains data from Quicken. Rumors of other bugs abound.

According to our tax accountant, a substantial number of people who run small businesses or who deduct business expenses would be affected. "In my practice almost 100 percent of my clients, in any given year, would have depreciated or amortized an asset in the final year of its life," she says. And that's only one of the six bugs that the company reported.

Shop Talk *is written and researched by* PC World *associate editor Christina Wood, with research assistance from Reader Liaison Peggy Nauts. Think you've gotten a raw deal—or a great one?* Consumer Watch *wants to hear the details. We'll investigate complaints and publish those letters with the broadest interest. See page 12 for contact information.*

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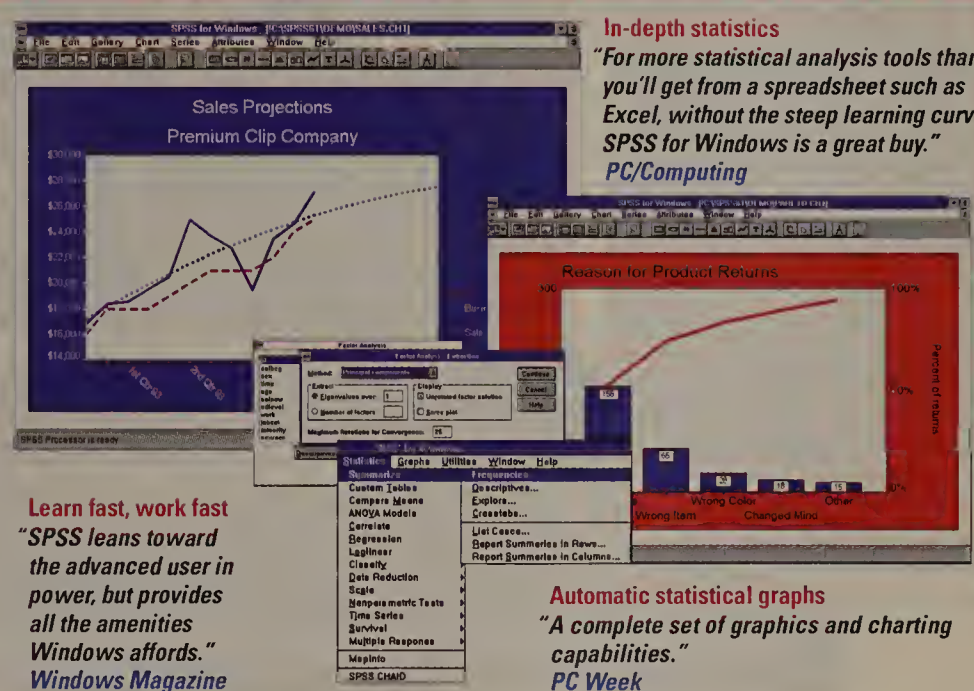

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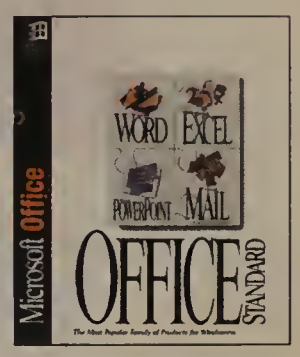

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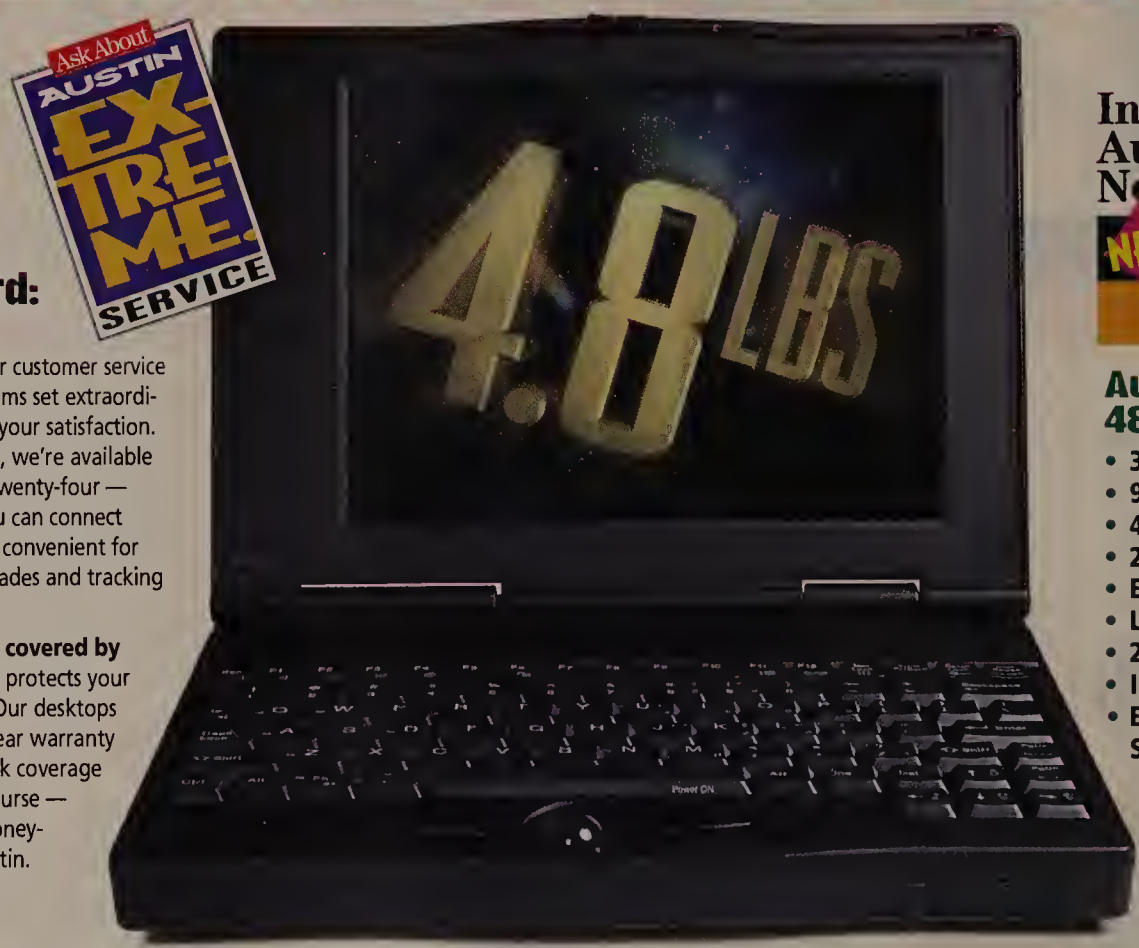

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The Fast-Growth Conundrum

Success is great, but it can bring too much of a good thing. When your company hits the big time, all the old ways of working no longer seem adequate. How do you train all the new people you need? How do you assure that senior staff aren't constantly interrupted with questions when the new people come on board? And how do you keep your hands on the reins while planning for future growth?

This month Robin Chikos, manager of technical information and publications at Flow International Corporation in Kent, Washington, describes how her company found a way to deal with these issues. —*Ed.*

Double the Revenues, Triple the Work

To most people, the idea of doubling revenues in four years sounds wonderful. But as a company grows, it can go through awkward phases. And employees often have to handle additional responsibilities without extra help.

I'm a technical information and documentation manager for a 20-year-old manufacturer of high-pressure water jets. (One customer, a large paper-products manufacturer, uses these jets to cut paper rolls without producing dust.) Four years ago I oversaw two employees who helped publish ten technical manuals a year.

But between 1990 and 1994, Flow International acquired four companies, added three product lines, and doubled its annual revenues to become a $100 million company with 700 domestic and international employees. Today I manage five employees who produce more than 24 manuals a year. I also oversee the creation of technical drawings and product information for some 4000 new parts each year. This kind of increase in workload is true for many of our employees.

The Nike Network

Before our company had this explosive growth, it acted like a small firm. Most employees carried the knowledge of our technology and business procedures in their heads. If new employees had questions, they would ask someone, who would usually stop to help.

This Nike network, as we liked to call it, was collegial enough, but it was also expensive. After all, we were paying professionals around $30 an hour, and every day we were losing one or two of those hours to questions.

As the company grew, the old Nike network became inadequate. During the four acquisitions, we gained new employees who had no idea how things were done at Flow International. Likewise, our old-timers needed to know how to make parts that had been made by the acquired company.

Training was thorny. Once, when faced with a project backlog, we needed 5000 labor hours but had only 3000 hours available from our staff. So we had to hire five contract engineers and designers who would have to become productive within a week. We made a training video, but it was insufficient.

No to Notes

It became clear we needed a way to share information. We started hunting around for a PC-based document-sharing system. Although we weren't certain what we wanted, we knew what we didn't want: We didn't want to set up a sophisticated database that required specialized technical skills. And while we were interested in something like Lotus Notes, we didn't want to pay for the OS/2-based server to run it. Nor did we want to cough up $40,000 to install Notes or hire a Notes administrator.

Robin Chikos, manager of technical information at Flow International in Kent, Washington.

We wanted something that nontechnical users could understand and that would operate with our existing Microsoft Mail and Windows NT software. Finally, we wanted something for less than $10,000. After much hunting, our MIS department found a product called Collabra Share that seemed to fill the bill. It cost just $9000 to install on a server and 150 PCs.

After installing Collabra Share on our network server (a Compaq 486/66 running Windows NT), our MIS department set up libraries, which Collabra calls forums, where documentation is stored in read-only format. At first glance, Collabra Share looks a lot like Windows File Manager. The product shows the user several forums we created (Policies and Procedures, Auto-

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That's just the way Marni Joslyn, head instructor of the Never Ever Ski School, wants it. After all, her job is to convince every stumbling, wobbly-kneed, double left-footed beginner that he can make it down the mountain. (And you think you've got it tough.)

Not surprisingly, before Marni brings her students to the mountain, she brings the mountain to her students. With PowerPoint 4.0, the leading presentation graphics software.

Since Marni's familiar with the Microsoft Office family of applications, she's already familiar with PowerPoint's menus and toolbars. This makes getting started and navigating her way around as easy as getting down the bunny slope.

How can she put such persuasive presentations together?

Simple. First, she clicks into AutoContent Wizard, which helps her organize and outline her overall presentation thoughts and even offers tips on content.

Next step, she clicks into AutoLayout Gallery and chooses a slide layout from the more than 20 options available.

As if that wasn't easy enough, there's the handy Pick A Look Wizard to help her create the right look for her presentation. In short, PowerPoint 4.0 helps Marni perform like a true professional.

As Marni is often heard telling her students, practice makes perfect. Fortunately, the Rehearsal feature allows her to do just that—practice, practice, practice, so she never has to worry about falling flat in front of her class.

What really makes Marni content at the end of the day is the power to take her students up that imaginary mountain and see them safely down again. (The only bruises the students

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have to show for their exhilarating descent are imaginary.)

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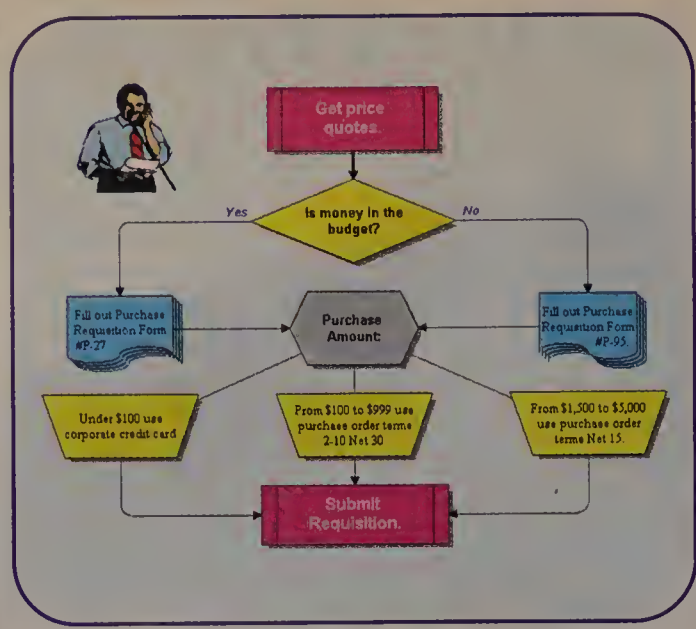

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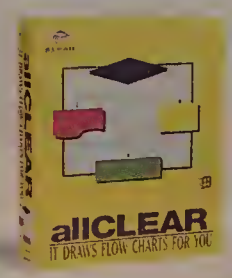

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Circle 26 on reader service card

CAD Users Group, Manuals, a specialized work-flow application called FlowTrac, and Sales Applications). By double-clicking on the AutoCAD Users Group, for example, an engineer can locate file cabinets such as AutoCAD Users Group Notes, and Document Control Notes. Within each cabinet are several folders; by clicking on Meeting Notes, you can see who has entered information and can read the message.

Within a few months, the question-and-answer interruptions began to disappear. Meanwhile, we were building a knowledge base; anyone with a good description of how something was done could put it into the system. We found we could retain the productivity of our experienced employees while offering good training for new folks.

While Collabra Share fulfilled many needs, we have had to be patient while the product improves. For one thing, users resent having to use something besides E-mail (with the release of Collabra Share 2.0, however, users will be able to click on a document icon in Microsoft Mail, which will launch Collabra Share). Nor can they see certain kinds of files, like CAD drawings, without launching another application. And so far, we are limited to storing read-only files, which is annoying when it comes time to revise documents (version 2.0 promises to allow editing).

Still, the benefits outweigh the problems. And the technology will play a key part in bringing us into conformance with ISO 9000 quality standards, which rely heavily on product and process documentation. Most important, we've found that without an information-sharing system like this, it would have been difficult to manage our rapid growth.

- **Collabra Share** 100 users $69 per user; Collabra Software; 800/474-7427, 415/940-6400, 415/940-6440 (fax), info@collabra.com (Internet)
  Reader service no. 633

Edited by Bronwyn Fryer

Bronwyn Fryer is a contributing editor for PC World. *If you use PCs to manage people and other resources in a business environment, we want to hear from you—we pay $300 for published columns.* *See page 12 for contact information.*

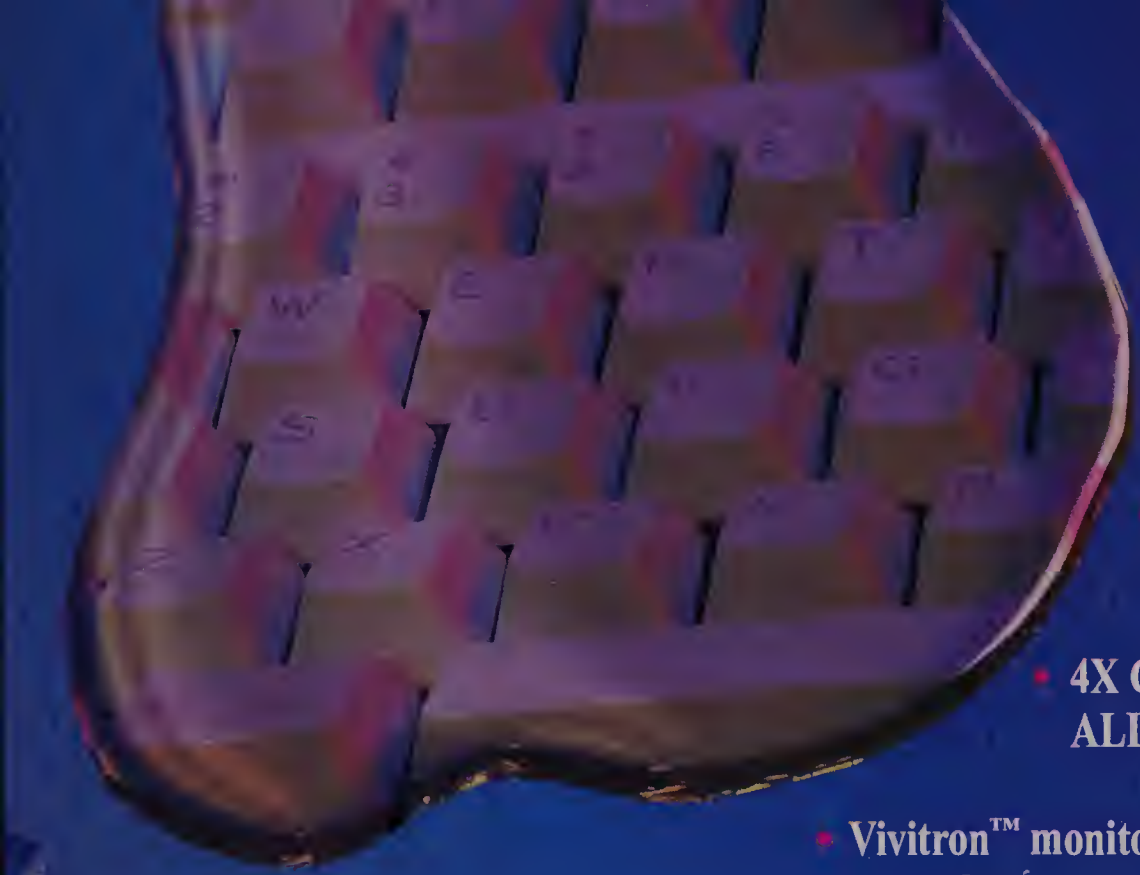
COOL CONCEPT

The elements of a Gateway 2000® PC are absolutely the very best we can possibly offer. You can try, but you won't find a hotter combination of leading technology, unrivaled performance and stellar quality. Now *that's* a cool concept.

HOT ELEMENTS

Latest Technology Ignites Unparalleled Performance

- New 120MHz processor — *PC/Computing* called our P5-120XL the "Fastest PC In The World!"
- Ultra-fast EDO memory
- Pipelined burst cache for breakneck speeds
- The 1.62GB hard drive — it's way fast and the largest IDE hard drive anywhere!



Features To Indulge In

- The PC industry's one-and-only 4X three-CD changer
- Incomparable Generations Software Collection with 51 titles
- 4X CD-ROM drives standard on ALL Gateway PCs
- Vivitron™ monitors based on Sony® Trinitron® technology
- MS® Office Professional — the #1 selling software suite in the universe
- The world's fastest version of Windows™ — MS Windows for Workgroups
- Our signature cow-spotted boxes — very trendy

Unconditionally The Highest Quality

- Only the very best name-brand components
- Our exclusive programmable AnyKey® keyboard
- Ergonomically designed MS mouse
- Every component we use to build your Gateway PC is quality audited
- Award-winning toll-free service and support for the life of your system
- Each and every Gateway 2000 employee wants you to have the best PC on the planet!

intel inside

GATEWAY2000

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GATEWAY2000
GATEWAY

BRINGING YOU ONLY THE VERY BEST!

It's a cool concept we've stuck to since Gateway 2000®'s opening day in 1985. Our definition of "the best?" It's simple: quality components, cutting-edge technology and the highest-performance PCs — all at incomparable values from the nation's leading direct market PC manufacturer.

The Best Performance

The New P5-120XL!

Things are really heating up in the PC world with the introduction of Gateway 2000's P5-120XL. This system was touted as the "FASTEST PC IN THE WORLD" by *PC/Computing*. The P5-120XL is an undisputable breakthrough, featuring a truly amazing combination of performance and speed with 16MB EDO memory, 256KB pipelined burst cache, a 1.62GB IDE hard drive and the industry's first 4X three-CD changer.

The Latest Technology

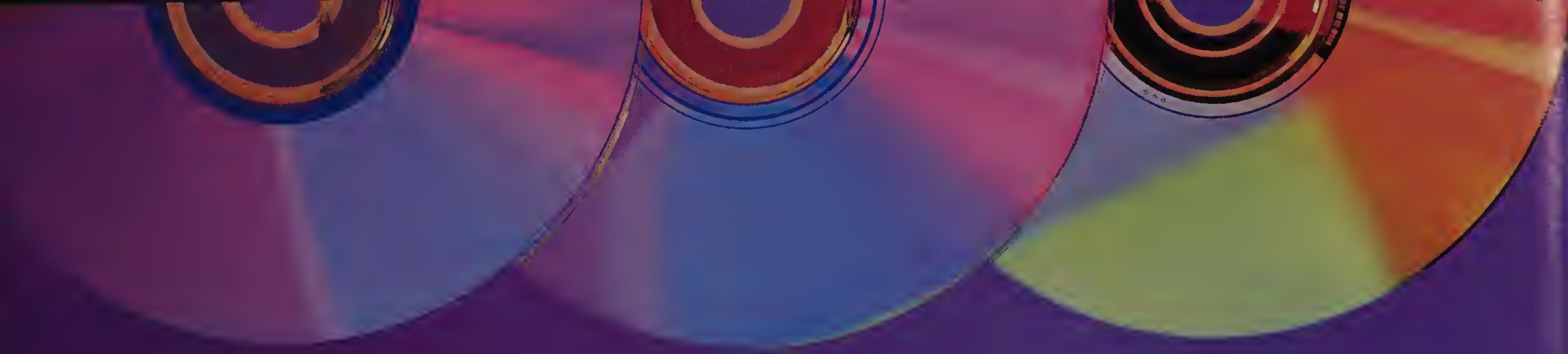
The latest memory technology and the performance of next-generation cache is here with the introduction of Extended-Data-Out (EDO) memory and pipelined burst cache, now available with the introduction of Intel®'s new Triton chip set. EDO memory, standard on our P5-75 Family PC™ multimedia system, P5-75, P5-100 Best Buy, P5-120 Best Buy and P5-120XL systems, is designed to deliver high-speed memory so you can easily whiz through memory-intensive graphics, number-crunching applications and future multitasking environments like Windows™ 95.

The EDO memory and pipelined burst cache on the P5-120XL create a bang-up combination of performance — together they produce breakneck speeds boosting system performance up to 20 percent. It's the ultimate memory combination for today's high-end Pentium™ processors.

Humongous, gargantuan, whopping — that's the only way to describe the 1.62GB hard drive — another star in Gateway's stellar performance lineup. It's the largest IDE hard drive you'll find anywhere, and it features Mode 4 support — you'll tear through tons of data in no time flat! The 1.62GB hard drive also features a super-impressive 9ms access time and 12.5Mb/s data transfer rate.

We've also led the industry with the addition of the ultra-fast 4X CD-ROM standard on our entire product line. With a throughput of 600KB per second, you can experience true full-screen, full-motion video. Plus, it's ATAPI compliant and ready for Windows 95.

GATEWAY 200



The Best Features

The Exclusive 4X Three-CD Changer

Gateway 2000 indulges your every computing desire with the world's best features! Introducing the 4X three-CD changer — we're the first in the industry to offer this multimedia user's dream. It's standard on our P5-100 Family PC multimedia system and P5-120XL and available as an upgrade on all other Gateway PCs. The 4X three-CD changer lets you breeze through today's CD-ROM-based software. You can load three CDs into the changer, which combined hold 1.8GB of data, and easily choose the correct disc through on-screen commands. It features a headphone jack, volume control, skip function, play indicators and play/pause control.

IS THE BEST!

Gateway's Incredible New Generations Software Collection

It's stupendous! Introducing the new Generations Software Collection from Gateway 2000 standard with our Family PCs. With 51 exciting titles on nine CDs, there's no limit to the remarkable resources at your fingertips. Applications include Microsoft® Encarta™ '95; MS Bob; MS Money 3.0; MS Works 3.0; MS Publisher; MS Publisher Design Pack; MS Cinemania® '95; MS Bookshelf®; MS Composer Collection: Beethoven, Mozart and Schubert; MS Wine; MS Arcade: Missile Command,™ Asteroids,® Tempest,™ Centipede® and Battlezone™; MS Dinosaurs; Mayo Clinic® Family Health; and Mayo Clinic Pharmacist; plus we've included dozens of popular Microsoft entertainment games.

MS Office Professional

Our professional PCs come with MS Office Professional 4.3 — the world's number-one selling software suite. It includes Microsoft's most in-demand applications: Word 6.0, Excel 5.0, PowerPoint® 4.0 presentation graphics program and Access® 2.0 database, plus Bookshelf and Money 3.0. It's the only office software program you'll need.

MS Windows For Workgroups

All Gateway PCs come standard with MS Windows for Workgroups 3.11 — the fastest version of Windows available.

Vivitron Monitors Are A Cut Above The Rest

Brace yourself for the vivid color and fantastic screen images available with Gateway's Vivitron™ monitors featuring Sony® Trinitron® tube technology — the technology the most discerning video users have relied on for decades. Our 15- and 17-inch Vivitron monitors, give you brighter, richer and crisper colors, a sharper focus and clearer image. With a .26 fine pitch, you'll also get high screen definition.

intel inside

The Coolest Extras

You get tons of other features with your Gateway PC including the TelePath IIv fax/modem Communication Center — it's a fax machine, modem and answering machine all in one!

Plus you get Corel Photo CD Sampler Special Edition Software; complete system documentation; a thirty-day money-back guarantee; a three-year limited warranty on all desktop PCs and monitors; on-site service in most U.S., Canadian and some international locations; and an easy door-to-door delivery plan for U.S. and Canadian customers. Write or call us a for a free copy of our warranty.

Our knowledegable service reps are at your beck and call for the life of your PC with toll-free support available in the U.S., Canada and Puerto Rico. We strive to give you the very best service and support. Thanks to votes of confidence from customers, we receive many awards. In fact, we topped the last five *PC Magazine* Reader's Choice Service and Reliability Awards.

The Best Quality

Each and every component in your Gateway PC is meticulously selected. Every processor, motherboard and peripheral is the best we can possibly offer. From our MS mouse to our AnyKey® keyboard to our famous cow-spotted boxes, we work to ensure that every item you receive with your PC is unsurpassed in quality.

The Best Value

Gateway 2000's prices are some of the most affordable in the industry. And we're offering all the performance, features and quality a PC user could hope for. This is what "value" is all about. Just flip the page and take a look at our configurations. We think you'll agree that giving you only the best really is a cool concept. Call us today and get *your* share of Gateway's best!

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Gateway 2000® Family PC™ Systems

4DX2-66 FAMILY PC

- Intel® 66MHz 486DX2 CPU*
- 8MB RAM
- 540MB 11ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- 4X CD-ROM, 16-Bit Sound Card & Altec™ ACS-5 Speakers
- TelePath™ IIv 14.4K Fax/Modem Communication Center
- 3.5" Diskette Drive
- 14" CrystalScan® Color Monitor
- 4-Bay Mini Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS® 6.22 & WFW 3.11
- Generations Software Collection†
- 3-Year Limited Parts Warranty

$1699

P5-60 FAMILY PC

- Intel 60MHz Pentium™ Processor*
- 8MB RAM, 256KB Cache
- 540MB 11ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM, 16-Bit Sound Card & Altec ACS-5 Speakers
- TelePath IIv 14.4K Fax/Modem Communication Center
- 3.5" Diskette Drive
- 15" CrystalScan Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Generations Software Collection†
- 3-Year Limited Parts Warranty

$1999

P5-75 FAMILY PC

- Intel 75MHz Pentium Processor*
- 8MB EDO Performance-Enhanced Memory
- 730MB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM, 16-Bit Sound Card & Altec ACS-5 Speakers
- TelePath IIv 14.4K Fax/Modem Communication Center
- 3.5" Diskette Drive
- 17" Vivitron™ Color Monitor
- 7-Bay Desktop Case
- AnyKey® Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Generations Software Collection†
- 3-Year Limited Parts Warranty

$2499

P5-100 FAMILY PC

- Intel 100MHz Pentium Processor*
- 8MB RAM
- 256KB Pipelined Burst Cache
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X 3-CD Changer, 16-Bit Sound Card & Altec ACS-5 Speakers
- TelePath IIv 14.4K Fax/Modem Communication Center
- 3.5" Diskette Drive
- 17" Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Generations Software Collection†
- 3-Year Limited Parts Warranty

$2999

Professional Systems

4DX2-66

- Intel 66MHz 486DX2 CPU*
- 8MB RAM
- 540MB 11ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- 4X CD-ROM
- 3.5" Diskette Drive
- 14" CrystalScan Color Monitor
- 4-Bay Mini Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Works 3.0 & Money 3.0
- 3-Year Limited Parts Warranty

$1499

P5-75

- Intel 75MHz Pentium Processor*
- 8MB EDO Performance-Enhanced Memory
- 730MB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM
- 3.5" Diskette Drive
- 15" Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional 4.3;** Bookshelf® & Money 3.0
- 3-Year Limited Parts Warranty

P5-75 $1999
P5-90 $2199

(90MHz Pentium processor w/8MB FPM DRAM, 256KB cache)

P5-100 BEST BUY

- Intel 100MHz Pentium Processor*
- 8MB EDO Performance-Enhanced Memory
- 256KB Pipelined Burst Cache
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM
- 3.5" Diskette Drive
- 15" Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional 4.3;** Bookshelf and Money 3.0
- 3-Year Limited Parts Warranty

$2499

P5-120 BEST BUY

- Intel 120MHz Pentium Processor*
- 16MB EDO Performance-Enhanced Memory
- 256KB Pipelined Burst Cache
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM
- 3.5" Diskette Drive
- 15" Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional 4.3;** Bookshelf and Money 3.0
- 3-Year Limited Parts Warranty

$2999

P5-120XL

- Intel 120MHz Pentium Processor*
- 16MB EDO Performance-Enhanced Memory
- 256KB Pipelined Burst Cache
- 1.62GB 9ms IDE Hard Drive w/ Mode 4 Support
- PCI Enhanced IDE Interface
- ATI Mach 64 Graphics Accelerator with 2MB VRAM
- 4X 3-CD Changer
- 16-Bit Ensoniq® Wavetable & Altec ACS-31 Speakers w/ Subwoofer
- TelePath IIv 14.4K Fax/Modem Communication Center
- 3.5" Diskette Drive
- 17" Vivitron Color Monitor
- 9-Bay Tower Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional 4.3;** Bookshelf & Money 3.0
- 3-Year Limited Parts Warranty

$3999

†Generations Software Collection

- Microsoft Encarta™'95 • MS Bob • MS Money 3.0 • MS Works 3.0 • MS Publisher • MS Publisher Design Pack • MS Cinemania®'95 • MS Bookshelf® • MS Composer Collection: Beethoven, Mozart and Schubert • MS Wine • MS Arcade: Missile Command,™ Asteroids,® Tempest,™ Centipede® and Battlezone™ • MS Dinosaurs • Mayo Clinic® Family Health • and Mayo Clinic Pharmacist • plus dozens of popular MS entertainment games.

If you can't find a system that suits your needs, call us and we'll be happy to custom build one for you.

***MS Office Professional 4.3 includes MS Word, Excel, PowerPoint® presentation graphics program, and Access® database.*

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International FaxBack Access 605-232-2561 • Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

THE BEST OF EXTRAS

Incredible values from Gateway 2000.® Peripherals and software sold only with the purchase of a system.

COMMUNICATIONS & STORAGE

TelePath™ IIv Fax/Modem Communication Center

Revolutionize your communication needs with the TelePath IIv fax/modem Communication Center. Internal fax/modem, 14,400bps modem, V.32bis, with 14,400bps fax capability. The FaxWorks Communication Center sends and receives both faxes and voice messages. Includes a CompuServe® trial membership. **$99**

Colorado Memory Systems® Jumbo 1400 TBU

CMS Jumbo 1400 internal tape backup unit with up to 1.36GB compressed (680MB native) storage capacity per tape. Comes with MS Windows™ and DOS® software, one tape and cable. **$199**

MULTIMEDIA

New 4X Three-CD Changer

Enhance the value and usefulness of your PC with the 4X three-CD changer. It supports multisession photo CDs and XA format, enabling simultaneous audio and data with additional hardware. You'll have access to three times the amount of information of a regular CD-ROM drive and the ability to switch between programs. **$100** *(upgrade from 4X CD-ROM)*

AUDIO MULTIMEDIA KIT

Here's everything you need to add multimedia to a Gateway PC.

- Gateway 2000 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with MIDI/game port, mic in, stereo line in/out
- 2 Altec™ Lansing ACS-5 speakers

$99 *(with system purchase)*

Wavetable Audio Multimedia Kit

Once you've heard wavetable audio, basic audio will never do!

- Ensoniq® Soundscape™ 16-bit wavetable sound card, MT-32 and FM mode compatible. Supports most software for popular sound cards and standards including General MIDI, Sound Blaster, AdLib, Roland MPU 401, MS Windows Sound Sytem and MT 32
- New Altec Lansing ACS-31 three-piece speaker system
- Blue Ribbon Sound Works' SuperJAM! jr. software

$209 *(with system purchase)*
$110 *(upgrade from systems with 16-bit sound card and Altec speakers)*

Kid's Backpack™

Seven exciting software applications designed specifically for kids. Includes Sesame Street® Numbers; My First Incredible, Amazing Dictionary; The Cat Came Back; The Yukon Trail™; Keroppi Day Hopper; Math Blaster®: In Search of Spot; and Sing-Along Kids™. Also includes a 20-disc storage rack and microphone. **$99**

Flight Pack

Seven top-of-the-line flight CDs. Includes TFX™: Tactical Fighter Experiment, Aces Over Europe, Maximum Comanche®, Strike Commander, Privateer, Wing Commander™ Armada; and Warplanes. You also get a joystick and 20-disc storage rack. **$99**

Call the Gateway 2000 special component add-ons division at 800-846-2080 for our complete line of extras for Gateway customers. Sales hours: 7am-10pm Weekdays.

Sports Pack

Six action-packed sports applications. Includes Unnecessary Roughness '95™; Hardball 4™; FIFA International Soccer; PGA Tour® Golf; NHL® Hockey '95; and NASCAR® Racing. Also includes Gravis GamePad™ and CD holder. **$99**

MONITORS

Gateway 17-Inch Vivitron™ Color Monitor

Non-interlaced color monitor using Sony® Trinitron® tube technology, capable of 1280 x 1024 resolution in non-interlaced mode, .26 dot pitch.
Upgrade from a 14-inch CrystalScan® 1024NI monitor **$360**
Upgrade from a 15-inch Vivitron monitor **$260**
(Upgrade prices good only at the time of system purchase.)

PRINTERS

Hewlett®-Packard 4L LaserJet Printer

A full-featured 300dpi printer loaded with enhanced PCL 5 and 26 scaleable typefaces with 1MB standard HP Memory Enhancement Technology. Includes parallel cable. **$559**

Epson® Stylus™ Color Ink Jet Printer

Features 360dpi high-quality print resolution and 720dpi for more brilliant colors on specially coated paper. Exclusive technology produces a precise dot. Includes parallel cable. **$529**

Hewlett-Packard Deskjet 540 Inkjet Printer

Features clear, sharp 600 x 300dpi black printing on plain paper with a variety of built-in typefaces. Color option also available. Includes parallel cables.
$299 (w/out color) **$339** (w/color)

Call for other printer options.

NETWORKING

3Com® Ethernet Adapters

High-performance 16-bit Ethernet cards from the world leader in Ethernet technology.
16-bit Triple Media Card supports BNC, AUI and Twisted Pair media **$109**
16-bit Twisted Pair Card **$89**

SMC® PCI Ethernet Adapter

Supports both Twisted Pair and BNC Media **$149**

National Semiconductor Ethernet Adapters

Infomover™ brand NE2000plus™ Ethernet cards
Triple Media Card w/ 25-foot coax cable **$89**
Twisted Pair only Card **$69**

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers. You can also apply for the Gateway 2000 DuoLine™ MasterCard® card, issued by Dial National Bank, Des Moines, Iowa.

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Now you can feel the same gut-tightening speed without the frostbite.

Sound Blaster Multimedia Home 4x is a multimedia fanatic's wish list with 24 of the greatest software hits, like Microsoft® Cinemania® '95, Microsoft Encarta™ '95, and Quicken® Deluxe CD-ROM.

Sound Blaster Discovery CD™ 4x takes you on a high-speed adventure with 18 cool software titles including, Strike Commander® and The Grolier Multimedia Encyclopedia™.

Or just upgrade your CD-ROM drive to quad-speed with our OmniCD 4x, which includes 6 awesome titles.

The New Sound Blaster Quad-Speed Multimedia Kits.

Introducing the coolest ride south of the Arctic Circle—the new Sound Blaster multimedia kits with quad-speed CD-ROM. They have everything you need to turn your ordinary PC into a screamin' machine. Like a Sound Blaster™ 16-bit sound card—the PC sound standard. Stereo speakers that will be the talk of the neighborhood. Plus today's most blistering software.

With our 4x CD-ROM drive, software loads faster and everything's in sync. And when tomorrow's games hit the ice, your ride will get even wilder.

Of course, these kits give you genuine Sound Blaster compatibility. Plus WaveTable upgradability and easy installation. So fasten yourself to a Sound Blaster 4x multimedia kit at your nearest computer store or call 1-800-998-5227 Ext. 120. And don't forget to lean into the curves.

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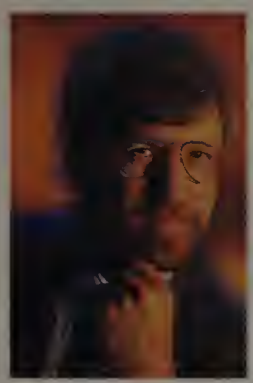
Back Scratchers for Sale



Does your back itch? Your keyboard makes a terrific back scratcher!

Or has a nail worked loose in your stairway? Just whack it back in with your computer's low-profile minitower case!

All right, I exaggerate. But only a little. We've become so addicted to our computers, we expect them to solve not just some of our problems but most of them. Since computers can deliver mail, play classical CDs, and display pornography, why, let's boot up! Are there cheaper and better ways to do the same things? Hey, since everything's digital, who cares?

Exhibit A: the Internet. You can now order a pizza via the Net. Those of us for whom time has value will still use a goofy low-tech device called the telephone, but the Net will undoubtedly be the ordering method of choice for unsocialized geeks who fear human interaction and have hours to spare fiddling around online. Come to think of it, that's the basic Net paradigm.

I'm certainly not immune to senseless computerization. The other day, I needed to check a particular fact in a recent issue of *PC World*. Faster than you can say <Alt>-<Tab>, I flipped to Program Manager, clicked on the icon for America Online, tapped in my password, and waited for the program to crawl into action.

As the modem began beeping, I remembered that a copy of the issue in question was downstairs on the living room table. Not only would retrieving the physical magazine be a lot faster than waiting for the online edition to appear, it would also be a lot easier on my eyes, my back, and my wrists and possibly even kinder to my waistline. I had instinctively called upon the do-it-all computer mostly because, like Everest, it was there. My computer, like yours, has become a hammer to which everything looks like a nail.

I became particularly attuned to this mild form of insanity after reading *Silicon Snake Oil: Second Thoughts on the Information Highway* (Doubleday, 1995, 800/323-9872) by Clifford Stoll, who has as least as much computer experience and savvy as the futurists whose digital hyperbole he rejects. (In the spirit of this column's title, I hereby disclose that he and I share both a literary agent and a publisher.)

Stoll makes strong cases for life's simple pleasures, real rather than virtual: the book, the card catalog, and snail mail. His subtext is that the information and communications "visionaries" who are so optimistic about the information highway and the digital future are the same people who stand to make money from it. The snake oil salesfolks show us the purported benefits of technology. Stoll reveals the costs.

This is a tremendous service, since many of those costs are hidden. To the majority of its users, for example, the Internet is apparently free. Infonauts rarely consider that institutions, governments, and taxpayers are subsidizing their Net-surfing habits.

Yet more and more governments and institutions (particularly libraries and schools with limited budgets) are expanding their computer facilities and online presence at the expense of desperately needed alternatives—like teachers and books.

According to Stoll, the California Department of Education figures it would take half a billion dollars to wire up every classroom in the state. Yet the system would undoubtedly be obsolete in less than a decade, and evidence that edutech investments ever pay off is in woefully short supply. How much did you actually learn from high-tech wonders of their era such as instructional films, classroom television, and language labs?

Other costs are subtler. For instance, as Stoll reminds us, paper is a cheap and powerful storage medium. You can easily read documents printed hundreds of years ago, no special equipment required. Can you say the same for the Great American Novel you created with your Texas Instruments 99/4A machine and stored on cassette tape in the early eighties? How much will it cost us 20 years from now when historical data we desperately need exists only on an obsolete medium (floppy disk) that can be read only by a few antique computers running an obsolete operating system (DOS)?

The Internet will undoubtedly be the ordering method of choice for unsocialized geeks who fear human interaction and have hours to spare.

In our quest for the newest, hottest, and fastest, we computer journalists often lose sight of a crucial question: What does it cost? True, the computer solutions we propose can often be wonderful. They can also resemble very expensive back scratchers.

PC World *contributing editor Stephen Manes is a columnist for the* New York Times *and coauthor of* Gates: How Microsoft's Mogul Reinvented an Industry *(Touchstone/Simon & Schuster, 1994, 800/223-2348).*

By Stephen Manes

ERIC BUTLER

An ordinary PC?

With a PC, people are confined to working alone. They can work:

On the same document (but not at the same time).

By e-mail (but not through their pager).

On the road (but good luck getting the kind of support they really need).

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Or a Globalyst™ PC&C?

With an AT&T Globalyst, people are free to work together:

Any time. Any place. Any way they want.

(That's what Personal Computing and Communications–PC&C–is all about.)

AT&T Globalyst features at no extra cost:

- ❑ MessageFlash™/MailFlash™: send key messages, e-mails to alphanumeric pagers.
- ❑ AT&T Vistium™ Share Software: work with others on the same file at the same time.

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WINDOWS 95: READY

After test-driving the latest beta of Windows 95, we're exhilarated and unnerved. Though we found

Edited by Randy Ross

OR NOT...

many impressive features, bugs rendered other options unusable.

A joke at Microsoft's expense has been circulating the Internet in recent months, a phony press release that trumpets the company's new "Cool User Program for Windows 95." For a mere $10,000, the release explains, Microsoft will place the user in a cryogenic deep sleep. Then, a week before the Windows 95 ship date, Microsoft will defrost the hibernating user, who must adjust to such societal changes as "faster-than-light travel and possible leaps in human evolution."

Joke shorthand: Will this operating system ever ship?

Although operating systems are notorious for *never* shipping on time, Windows 95 holds a special place in the annals of vaporware—not only because it's over a year late, but because it's the most anticipated (and hyped) major software release in years. Microsoft has spent two years trumpeting Windows 95 as the upgrade path for millions of DOS and Windows PCs. The operating system includes 32-bit memory addressing, multitasking, multithreading (which allows a single program to perform multiple tasks simultaneously), automatic hardware detection to simplify upgrades, a dramatically redesigned user interface, and sophisticated communications and networking features. Microsoft argues that these advanced features make Windows 95 essential to nineties-style computing.

Despite press reports of serious, performance-hampering bugs in what Microsoft called the last test release of Windows 95 before shipment, the company is still promising an August delivery date. Testing this "final" beta copy, we found Windows 95 a mixed bag: There's a lot to like, but the program is disquietingly buggy for a product just weeks away from shipping.

Ship It or Else

Microsoft has a strong incentive to deliver Windows 95 as soon as possible. According to industry analyst Jeffrey Tarter, editor and publisher of *Softletter* in Watertown, Massachusetts, the company expects to sell a whopping 10 million–plus copies of Windows 95 within six months of its release.

Industry analysts and Windows 95 beta testers we spoke with agree that Windows 95—while still buggy and far from perfect—will ship in August. "The problems will have to be really, really serious for [Microsoft] to back down from the August ship date," says Jeff Silverstein, editor and publisher of the *Software Industry Bulletin* in Stamford, Connecticut. Another delay, he suggests, would cause "major headaches" for PC manufacturers and software publishers, most of whom have spent months developing products for Windows 95.

Meanwhile, Microsoft is still hard at work. In early April, computer trade weeklies reported a serious bug in the M8 final beta that severely limited the number of 32-bit applications that could run simultaneously under Windows 95 (a flaw we confirmed here at *PC World*). At press time Microsoft claimed it had fixed the bug, but it hadn't yet sent new code to beta testers.

Breaking News

COMPAQ SUES PACKARD BELL: Compaq claims Packard Bell has incorporated used parts in PCs sold as new. In a lawsuit filed April 10, Compaq alleged Packard Bell engaged in false advertising, unfair and deceptive trade practices, and unfair competition. Packard Bell sells more home PCs in the United States than any other vendor, and Compaq is its closest competitor. In court documents, Compaq says it interviewed former Packard Bell employees, who disclosed the existence of a facility for dismantling returned PCs and recycling parts into systems labeled new. The suit also claims Packard Bell changed serial numbers to make PCs appear new. Beny Alagem, Packard Bell president and CEO, responded in a statement that fell short of denial. "No substandard part is ever incorporated into product shipped by Packard Bell," he said. "We subject all returned systems—and every component—to a quality assurance review which we believe is the most stringent in the industry." —L. M.

K5 DELAY WON'T IMPACT PENTIUM PRICES: AMD's postponement of its Pentium-class K5 microprocessor until 1996 won't affect prices of Pentium PCs. That's the word from Dataquest analyst Martin Reynolds, who says that AMD had planned to build only "a few hundred thousand" K5

(continued on page 61)

LEFT: JEFF BERLIN; ABOVE: JEFFREY PELO

Beta Bugginess

After testing the most recently available beta, we remain impressed with Windows 95's intuitive interface, its robust performance running DOS and 16-bit Windows applications, and its Plug and Play features that automate the previously hellish task of installing peripherals.

However, due to the numerous bugs that we and other testers have uncovered, it's impossible to pass final judgment on Windows 95 until it actually ships. During our testing, many elements seemed rock-solid, including the Explorer, a File Manager replacement that organizes files into folders. Still, many other features were buggy. The communications tools, including the Phone Dialer and Microsoft Exchange (a unified in/out-box for E-mail, fax, and voice messages), often failed to complete basic tasks such as dialing phone numbers and addressing E-mail messages. And often when we clicked 'Cancel' to end a failed communications task, the system would ignore our request and keep trying—then post frequent error messages when we'd moved on to other tasks.

Many other features were still unfinished, including the important (if unglamorous) Uninstall utility, and the portion of the Find utility that lets you search for files on the Microsoft Network, the company's upcoming online service. In fact, the network was in an embryonic stage. Each time we logged on, 'Under Construction' signs blocked access to services. Microsoft asserts this situation will change by the time Windows 95 ships and the network opens its electronic doors to the public.

Another unsolved mystery is how well Windows 95 will run on the existing base of 386 and low-end 486 PCs. After installing the operating system on a 25-MHz 486 Compaq Deskpro with 4MB of RAM and a 120MB hard drive, we had a mere 79MB left for other applications. Windows 95 didn't perform noticeably faster than Windows 3.1, and since the Deskpro lacked a CD-ROM drive, we spent over 2 hours swapping the program's 12 disks while installing it from the floppy drive.

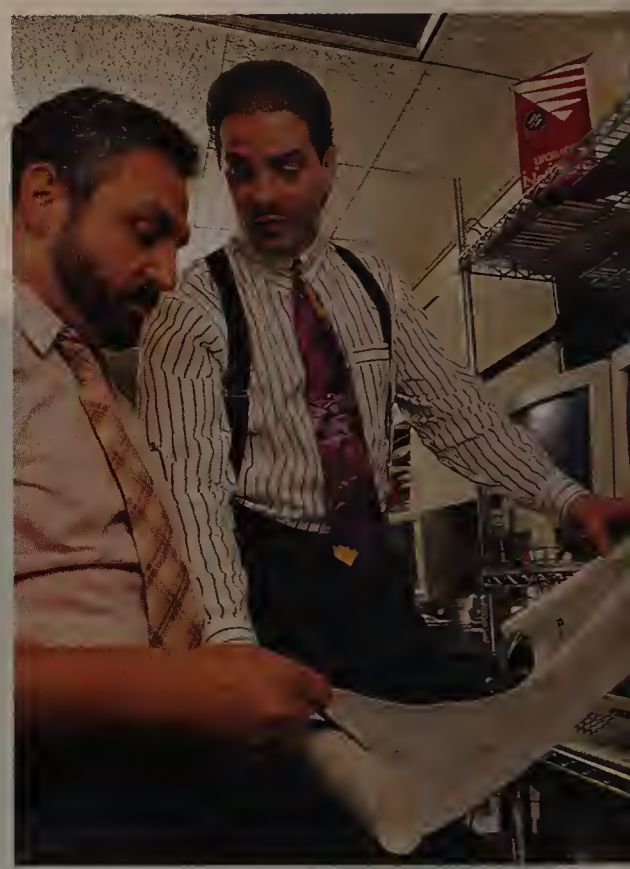
But perhaps the ultimate wild card is Windows 95's ambitious Plug and Play utility that automatically detects your PC's hard disk, CD-ROM drive, sound board, and other peripherals—plus any new de-

Windows Apps: 3.1 Down but Not Out

Despite the hype surrounding the pending release of Windows 95, some vendors have interim plans to ship new Windows 3.1 apps. Lotus expects to ship a new Windows 3.1 version of Ami Pro, called Word Pro, this summer (see "Ami Pro—New Name, New Face"). This product will contain the key features Lotus plans to add to its Win 95 version. So do you buy now or wait?

"I'm going to wait a while on Windows 95—see how the bugs play out—but I'm not going to rush out and buy 3.1 applications now," says Joe Anello, MIS director for the surgery department of the University of Pennsylvania Hospital in Philadelphia. "It'll be hard to justify the cost of buying 3.1 applications when Windows 95 applications could arrive months later."

Plenty of evidence supports Anello's strategy. Other than Lotus's Word Pro (and possibly other SmartSuite apps), new Windows 3.1 apps from big-name vendors may be few and far between. Microsoft and Novell say they have no immediate plans to ship 3.1 versions of their popular word processing, spreadsheet, and database products. Windows 3.1 apps from smaller vendors may not run perfectly under Windows 95, says Jeffrey Tarter, publisher of *Softletter*. "There are bound to be glitches," he says. And Microsoft has little incentive to worry about compatibility with smaller programs, he adds.



WAITING FOR APPS: University of Pennsylvania Hospital MIS director Joe Anello (right) confers with an associate.

BRAD BOWER/MERCURY PICTURES

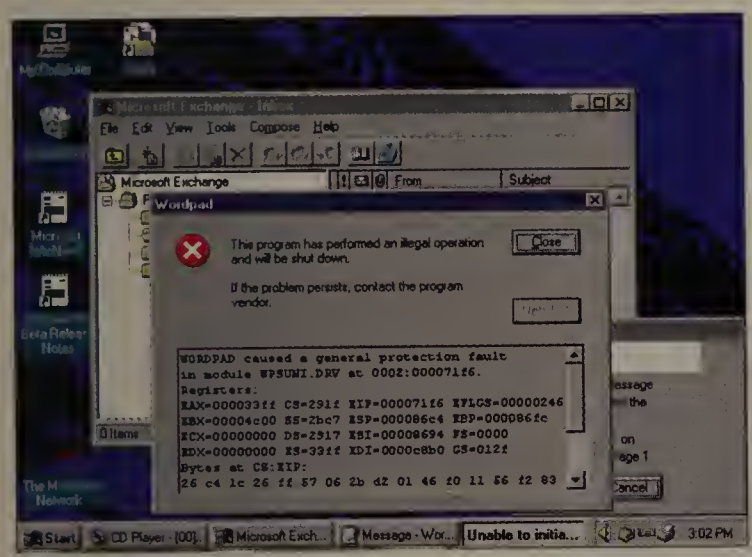
Nonetheless, if a Windows 3.1 application is likely to boost productivity now, it might very well be worth buying. Lotus's Word Pro offers unique group editing features that could save you substantial time and aggravation. But if your current programs will do the trick for another few months, hanging on to the money in your pocket may your best software-buying strategy for the time being.

—Laurianne McLaughlin

Suite Upgrades—When They're Coming

For Windows 95	Expected ship date
Microsoft Office	soon after Windows 95 ships
Lotus SmartSuite	end of 1995
Novell PerfectOffice	end of 1995
For Windows 3.1	**Expected ship date**
Lotus Word Pro *	summer 1995
Microsoft Office	no immediate plans to upgrade
Novell PerfectOffice	no immediate plans to upgrade

* Other 3.1 SmartSuite applications may also be upgraded.



UNDER CONSTRUCTION: Windows 95's WordPad word processor displays a user-unfriendly error message.

vices you install. In our tests, Windows 95 identified most hardware components but failed to recognize CD-ROM drives on two separate systems and couldn't identify a 14.4-kbps external modem from The Complete PC, a company no longer in business. We believe that Windows 95 will have the most trouble configuring and managing obscure peripherals designed before the inception of Plug and Play.

Testers Testify

Generally, Window 95 beta testers we've talked with review the new operating system favorably. "It's easier to install than OS/2 Warp," says Reagan Andrews, a clinical psychologist and former president of the North Texas PC Users Group in Dallas. Industry analyst Jamie Lewis, president of The Burton Group in Salt Lake City, contends that Windows 95 is in good shape compared to other operating systems such as OS/2 and Windows NT at this stage in their evolution.

Better Than Windows 3.1?

For many business and home users, the big question is whether Windows 95 is a more stable operating environment than Windows 3.1, and early indications suggest that it is. "From a day-to-day standpoint, it certainly doesn't crash any more often than Windows for Workgroups," says analyst Lewis. He recommends that businesses put Windows 95 through testing before committing to widespread installation.

Ultimately, Windows 95's longevity will be determined by how well it runs native 32-bit applications. But so far these programs have been hard to come by. "There just aren't a lot of 32-bit applications to test, and the ones that have been written aren't optimized yet [for Windows 95]," says Rob Enderle, operating systems analyst for Dataquest of San Jose, California.

Right now, all the signs indicate that Windows 95 will ship in August—ready or not. "The real question is how serious the flaws will be in the first shipping version," Silverstein says.

—Jeff Bertolucci

JEFFREY PELO

Planning Ahead: How Much Headache?

Your experience installing and running Windows 95 will depend on your system configuration.

Migraine

- pre-486DX2 system
- no CD-ROM drive
- obscure peripherals
- custom apps
- 4MB RAM or less
- old device drivers
- older Windows and DOS apps

Low-grade pain

- 486DX2 or Pentium-class system
- CD-ROM drive
- widely supported peripherals
- 8MB to 16MB RAM
- up-to-date drivers
- new Windows apps
- few or no DOS or custom apps

Painless

- Pentium-class system
- CD-ROM drive
- Windows 95 preinstalled
- 16MB RAM or more
- Plug and Play hardware
- new Windows 3.1 and Windows 95 apps

Breaking News

(continued from page 59)

chips this year anyway—not enough to affect Intel's pricing strategy. However, the K5 delay might cause Intel to postpone introduction of its fastest (150-MHz and beyond) Pentiums. "If AMD doesn't come out with a fast K5, Intel may not push as hard with the next generation of Pentiums," Reynolds says. —J. B.

NEXGEN GETS BOOST FROM COMPAQ: Compaq Computer recently revamped its consumer and small-business product lines to offer more Pentium-class systems. But inside some of these machines will be microprocessors from a supplier other than Intel: tiny NexGen, whose Pentium-class CPU made it to market ahead of chips from larger rivals AMD and Cyrix. Compaq, the world's leading PC manufacturer last year, plans to market computers with a 586 designation; customers won't necessarily know whose chip is in the system, and Compaq doesn't plan price differences between Intel- and NexGen-based models. —J. A.

WHEN 17 EQUALS 15.8: Twelve PC monitor makers have been charged with violating California consumer protection laws. A lawsuit filed by the Merced County district attorney's office alleges that marketing monitors by their diagonal CRT size constitutes deceptive advertising, since the viewable area of screens is smaller than

(continued on page 63)

Web Publishing Made Easy

As president of Premier Insurance Group, an insurance company in Houston, Dan Schultz understands planning for the future and the nature of chance. So in May 1994 he paid a consultant $650 to set up an electronic storefront for Premier on the World Wide Web, the multimedia portion of the Internet. He saw an opportunity to be a pioneer on the information superhighway. "Insurance agents tend to be conservative, but I wanted to be first [on the Web]," Schultz says. "I would have paid $30,000."

THE WEB IS BOOMING, says consultant Carol Blake. She helps her 50 clients reach users of the Internet.

The business generated by his Web site has thus far been limited to customers who work odd hours and can't meet with an agent or who prefer buying online to meeting face-to-face with a salesperson. Many additional prospects have tried out his automated online quote worksheet. "It hasn't taken off yet like I thought it would," he says. "I hope it will pick up, but I still see it as a good business tool."

Like many Internet pioneers, Schultz recognizes that today's Web is a bleeding-edge advertising medium. Since its introduction two years ago, the Web has enjoyed explosive growth. Yet despite breathless reports of multinational corporations with Web sites that generate a million or more customer contacts per month, many sites produce only a handful of contacts per week, few of which turn into sales.

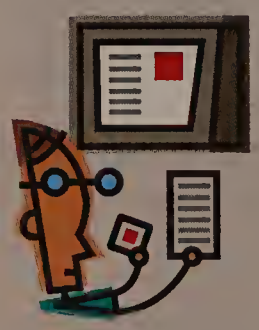
Some brave people set up their own sites. Others, like Schultz, turn to consultants who charge up to $3000 to develop a basic Web site—essentially a business advertisement—and keep it online for a year. Setting up a highly interactive site might cost $30,000 or more. So if the traffic isn't especially heavy and the start-up cost is high, why bother?

The answer: You can't afford not to. The Web, or its future descendant, is the technology that delivers on the promise of the information superhighway. It combines the impact of the printing press, the interactivity of the telephone, and the reach of television—all in a point-and-click interface. While only an estimated 2 million people have access to the Web today, industry watchers see it growing at a rapid pace. It comes as no surprise that businesses are rushing in to tap this new market: The number of Web sites is doubling each month, according to industry estimates.

Carol Blake, a Web marketing consultant based in New Orleans, finds no shortage of companies of all sizes setting up shop. The businesses that go online, she says, tend to put up two types of pages: static pages to publicize products or services; and dynamic, interactive sites for sales, customer support, and outreach to the Internet community.

Now is a good time to consider setting up a Web page for your company because a new crop of Windows tools lets anyone with solid computing skills perform much of the work. (Previously, creating a page required UNIX expertise and specialized tools.) Creating a Web page is a lot like cre-

Creating a Web Page: Roll Your Own or Hire Out



Roll your own if you want to publish basic documents such as:

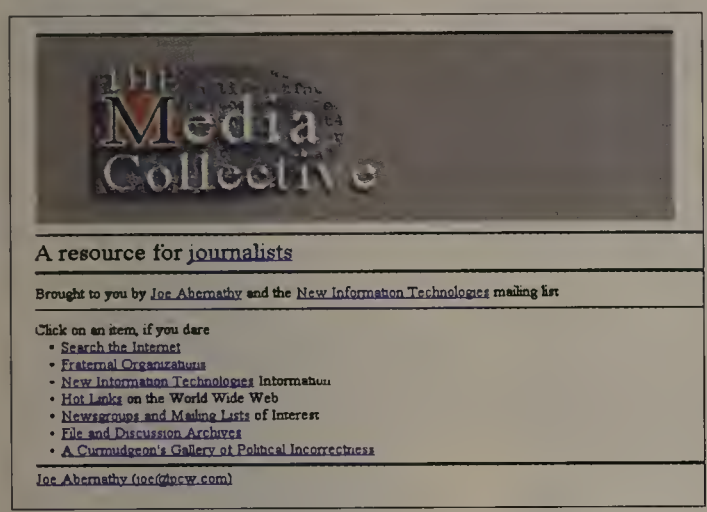
- a list of customer contacts for internal use by employees
- a list of phone numbers for your customers to use
- a business brochure with simple graphics

Hire help for more complicated projects such as:

- a product catalog database with a price list and order forms
- a multipage product brochure with extensive graphics
- an interactive customer support center

To keep costs low, generate the text and photographic images in-house with an HTML tool such as WebAuthor for Word for Windows, from Quarterdeck Office Systems. Hire a consultant to add the graphics you can't create yourself as well as the interactive elements, such as fill-in forms. Consultants can charge up to several thousand dollars for a highly interactive multipage Web site.

ILLUSTRATION: GORDON STUDER; PHOTO: FRANK ROGOZIENSKI



INVESTING IN ART: A logo created by a consultant adds zip to this homemade Web page.

ating any other PC-based document. You write text, gather visual elements (such as logos and photographs) and digitize them, and then convert the whole document to the Web's hypertext markup language (HTML) format. We'll discuss the process, the tools you need, and when it's a good idea to hire a consultant.

Planning Ahead

Your Web site is only as effective as the effort you put into it, Blake says. The trick is to determine what you can do yourself and what you need to turn over to a consultant. First, consider what you want on your Web site. If all you want is a brochure to attract prospective customers, the only graphic you need may be a simple logo or picture of your business. You could create such a page yourself in an afternoon.

But if you want to publish an entire product catalog online—a task that would require creating many pages with digitized images—you may be better off hiring an expert. Other complex projects that might require outside help include Web sites offering interactive customer support, online order processing, or multimedia effects such as video. If you want to create a searchable database—say a parts catalog—you'll also want to consider outside help.

Building your own Web page has never been easier. Using your PC and new publishing tools, you can make it happen—with minimal expense.

Once you've narrowed the scope of your project, determine your resources: What level of in-house graphic design talent is available? What's your deadline? How much can you spend? Doing the job yourself from scratch could require weeks to learn the tools and get the site up and running. Contracting out a simple project, say a five-page brochure, runs between $1000 and $5000 for design, setup, and a year's worth of maintenance.

If a consultant appears to be like your best bet, call your Internet service provider for recommendations. If that doesn't pan out, look for an advertising agency that handles this kind of project. Ask to see samples of its work, and request a step-by-step proposal of what it will provide. Insist on performance milestones, because many Web consultants are still learning as they go.

Even if you plan to hire a consultant, consider doing as much of the work as possible in-house. For instance, if all your business documents are already formatted in Word for Windows, you could cut your costs by as much as 50 percent.

Generating Content

To create your Web page, start with a word processor that supports graphics and other multimedia. If you already have a significant number of business documents in electronic form, feel free to use your favorite word processor and convert the files to Word later. You can add pictures and logos to the text and, if you're ambitious, audio and video elements.

For simplicity, avoid creating original art. Thousands of clip art images are available to serve as thumbnails and spot art. For larger images, consider a source such as the

Breaking News

(continued from page 61)

the CRT itself. Says Gordon Spencer, the district attorney overseeing the case: "If you're buying a pound of hamburger, you don't expect the butcher to weigh the wrapping." *PC World*'s tests of 39 monitors found that 17-inch displays averaged a viewable diagonal area of just 15.8 inches, while 15-inch units averaged 13.9 inches. The companies named in the suit—including Apple, Compaq, Dell, IBM, and NEC—could face stiff monetary penalties if found in violation of California law. —M. D.

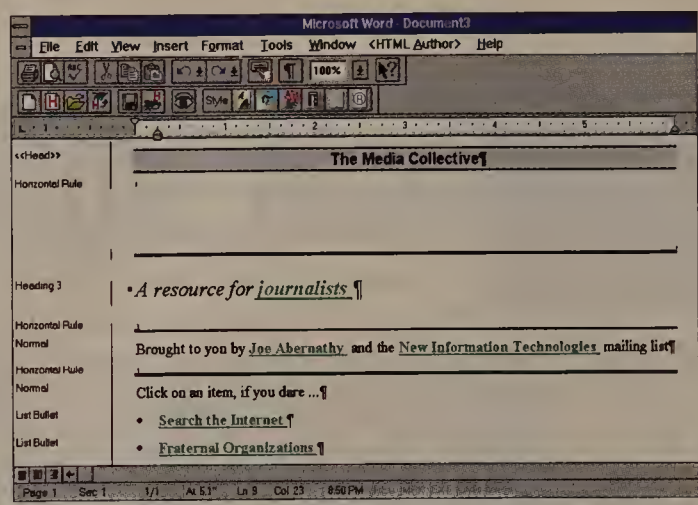
NEW SUITE OF DESKTOP APPS...FROM IBM: Big Blue plans to ship StarOffice, a new desktop application suite, by August. In this surprise move, the company will take on industry giants Microsoft, Lotus, and Novell, who are already battling fiercely for suite customers. IBM's suite will include a word processor (StarWriter,) a spreadsheet (StarCalc) and a graphics package (StarDraw). IBM acquired the rights to StarOffice from a German Company, Star Division. (In June IBM plans to ship a low-end database, which may be included the suite.) StarOffice pricing will be similar to that of Microsoft Office and Lotus SmartSuite, IBM says. StarOffice will first ship in versions for older versions of OS/2, OS/2 Warp, and Windows 3.1, followed by versions for Macintosh, Windows NT, AIX (UNIX), and Windows 95. —L. M.

JEFFREY PELO

new $995 Corel Stock Photo Library, which gives you 20,000 royalty-free images on 200 CDs.

If you still want to use your own photos, the least expensive tack is to have the film processed by Seattle FilmWorks. For $4 more per roll than standard processing, which usually costs about $10 per roll, you receive a disk with digital images of your photos. You'll also need to buy the company's $49 PhotoWorks Plus software to view and manipulate the images and convert them to various formats. Another option is Kodak's Photo CD, which costs roughly $25 per CD, in addition to processing charges and a fee per picture that varies depending on who does the work.

If you plan to create or update images on your site frequently, consider purchasing Kodak's new Digital Camera 40. It stores 48 photos electronically and downloads them directly to your computer. At $995 it's a luxury, but it also fits into a broader line of products recently introduced by Kodak designed to streamline in-house publishing and support services.



QUARTERDECK'S WEBAUTHOR add-in lets you convert Word documents into Web pages.

Putting It Together

Once you've gathered your content, assemble it in your word processor as you would any other document. Your next step is to save the file in HTML format using a conversion product. HTML supports *tags*, which tell the Web what's a headline, what's a link to another document, and so forth.

A few Word for Windows add-ins offer HTML support, and Microsoft supplies a free add-in for Word, although you will not find it very robust. If you are serious about creating Web pages in Microsoft Word, a recommended solution is Quarterdeck's WebAuthor for Word for Windows ($149). If you don't use Word, you'll need a stand-alone HTML word processor; your best bet is SoftQuad's $195 HotMetal Pro. And users of WordPerfect will soon have an option of their own: Novell is expected to introduce an HTML converter for its flagship word processor.

Getting and Staying Online

Once you assemble your page, you "publish" it, using the software and hardware known as a Web server. You can rent space on the server at your Internet service provider, typically for $100 to $500 per month, depending on the storage your site requires and the traffic it generates. Your consultant may have a Web server on which you can lease space.

A site with a one-page brochure requires little maintenance. Updating documents such as lists of products or phone numbers is usually easy. In general, the more interactive your site, the more maintenance it requires. If you accept orders or provide customer support from your site, you need to assign the task to someone in-house or hire a consultant.

Currently, there's no more exciting place for your company than the Web. And new PC tools for creating a Web site can save you time and money. So start small, set realistic goals, and embrace the future.

—Joe Abernathy

Tools of the Trade

HARDWARE

Kodak Digital Camera 40
Take pictures and transfer them directly to your computer.
$995
Eastman Kodak Co., 800/235-6325
Reader service no. 830

Pro Imager 4000
Flatbed scanner delivers professional quality for a down-to-earth price.
$2995
PixelCraft, 800/993-0330
Reader service no. 831

Video Blaster RT300
Make your site stand out with video clips.
$499.95
Creative Labs, 800/998-1000
Reader service no. 832

SOFTWARE

Corel Stock Photo Library
20,000 high-quality images.
$995 for entire set of 200, $24.95 each additional title
Corel, 800/772-6735
Reader service no. 833

Fractal Design Painter
Distinguish your Web pages by adding special effects.
$499
Fractal Design Corp., 800/297-2665
Reader service no. 834

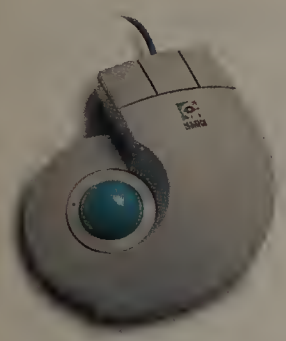
HotMetal Pro
Word processor for creating HTML documents.
$195
SoftQuad, 800/387-2777
Reader service no. 835

PhotoWorks Plus
Digitizes your film.
$49 plus $4 per roll of film
Seattle FilmWorks, 206/281-1390
Reader service no. 836

WebAuthor for Word for Windows
Word add-in converts documents to HTML format.
$149
Quarterdeck Office Systems, 800/354-3222
Reader service no. 837

For more information about all products in this article, circle reader service no. 916.

LOOKS LIKE YOU COULD USE A MOUSE TRANSPLANT.



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LOGITECH

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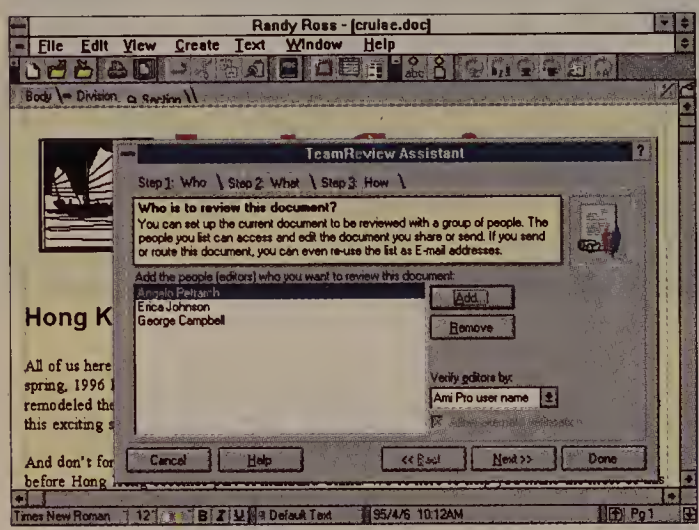
Ami Pro—New Name, New Face

TEST DRIVE ▶ Ami Pro users have waited...and waited... for version 4.0. Ami's clean interface, low system requirements, and strong layout features make for loyal users. Their patience is about to be rewarded, but with some surprises: Ami Pro is now called Word Pro, and its emphasis is on workgroup tools. The early beta release shows plenty of innovations.

The TeamReview Assistant lets you assign multiple workers to a document, set access levels, and automatically route edits to the team over any E-mail system. Lotus Notes users can add Notes commands to Word Pro menus, and vice versa. Multilevel comments, a highlighter, multieditor revision markings, and multiple revisions stored in the same document help teams work efficiently. The TeamConsolidate toolbar then helps you find and accept or reject edits to create a final opus. These team editing features are the best I've seen.



SETTING UP A TEAM to produce a document takes just three steps in Word Pro using the TeamReview Assistant.

There's now a multilevel undo capability, and SmartMaster fill-in-the-blank templates offer 'click to insert' buttons for objects of any kind. This feature is great for creating fill-in-the-blank forms. On-screen tabs offer quick access to sections. For formatting, a unique, floating, multifunction dialog box changes to suit the object being formatted; any changes you make are instantly reflected in the document. Menus change to suit different tasks.

The spelling checker highlights unrecognized words and lets you fix errors in any order. You can also check spelling as you type. Other tools automatically correct common spelling, punctuation, and spacing errors.

The first release of Word Pro will be for Windows 3.1, but expect Windows 95 and OS/2 versions soon after. Word Pro is a powerful update for Ami Pro users but probably won't lure many Word and WordPerfect users, who will want to wait for their own Windows 95 versions.

—George Campbell

Word Pro for Windows 3.1

A wealth of advanced tools makes this long-overdue update worth the wait.

Key Features: Advanced workgroup editing • Tabbed formatting dialog boxes • Notes tie-ins • Section tabs

Pricing: Unavailable

Availability: Summer 1995

Lotus Development Corp., 800/343-5414

Reader service no. 826

Photo-Quality Color for Less Than $1000

High-quality color just got affordable. NEC's SuperScript Color 3000 is the first printer under $1000 with both thermal-wax and dye-sublimation technologies, which yield the richest color images.

This quality of output previously required an outlay of $2000 to $8000. Only graphic artists and art departments could justify the expense. NEC's price makes color practical for a wider audience.

The 300-dpi SuperScript Color 3000 has three print modes: dye sublimation (for highest quality), and both standard and enhanced thermal-wax modes for less demanding jobs. Enhanced thermal-wax output is almost as good as dye-sub output for less than half the cost per page.

I used the printer to enliven business documents. The color is brighter and more realistic than you get from $400-to-$600 color ink jets, especially for photos. With a fast 486, I printed 1 to 2 pages per minute in thermal-wax mode. Enhanced and dye-sub modes can take up to 10 minutes per page.

Dye-sub output from NEC's SuperScript Color 3000 (above) looks better than a color-ink-jet sample from Canon's BJC-600e printer.

The downside: It's not easy to use. The NEC printer comes with a ribbon for each print mode but holds only one at a time. To change modes, you must change the ribbon, a delicate, inconvenient operation. Ink jets, like Canon's $450 BJC-600e, are much easier to use. Also, NEC doesn't offer PostScript—even as an option. (It's a $400 option for Fargo's $1895 600-by-300-dpi thermal-wax and dye-sub PrimeraPro, but the Fargo lacks enhanced thermal-wax mode.)

The SuperScript Color 3000 has 2MB of RAM and uses the Microsoft Windows Printing System. NEC Technologies, 800/632-4636. Reader service no. 827

—Laurianne McLaughlin

ILLUSTRATION: GORDON STUDER

NEW!
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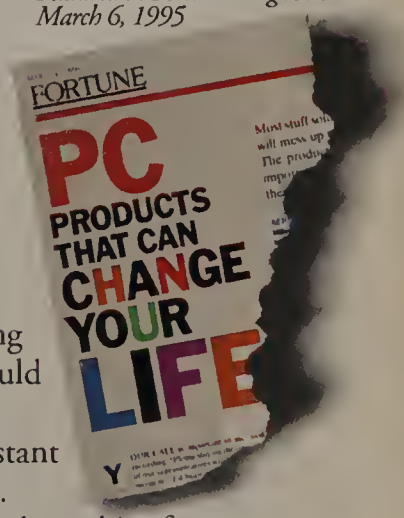
Featured in Fortune Magazine
March 6, 1995



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Plextor First With 6X CD Drive

TEST DRIVE ▶ Just when you thought your quad-speed (4X) CD-ROM drive was state of the art, here comes a whole new generation of 6X CD-ROM drives that delivers data at up to 900 kilobytes per second (K/sec)—six times the speed of the original 150-K/sec drives. Coupling fast data transfer with fast access speeds, the drives approach hard disk performance levels, with implications for changing the way you work.

We looked at the Plextor 6Plex, the first shipping 6X drive (although by the time you read this, the 6Plex won't be alone). It's an impressive drive, solidly built and designed for full-time use. For now, the 6Plex is available only as an internal model, although an external unit will ship soon. It has a 256K cache and, like other high-end CD-ROMs, a SCSI-2 interface. The 6Plex is available with or without SCSI boards and includes a high-performance driver designed to maximize video performance.

Fleet Speed

We tested the 6Plex against Plextor's quad-speed 4Plex and against Toshiba's quad-speed XM-3501B and dual-speed XM-3401E1. As expected, the 6Plex was the performance winner in tasks requiring random data access, such as running a program or searching a database. The 6Plex not only boasts a fast transfer rate, it also has a brisk 145ms random-access time, among the fastest we've seen. The Toshiba 2X's access time is 320ms; the Toshiba 4X's is 150ms. The 6Plex's overall speed opens up tempting new ways of using CD-ROMs. For example, we ran CorelDraw directly from CD-ROM instead of loading it to the hard disk, and performance was more than acceptable.

The 6Plex's performance with multimedia isn't nearly as dramatic as with data-only applications. With standard computer data such as programs, text, or database files, a CD-ROM drive acts like a standard hard drive, transferring data at the drive's maximum speed. Full-motion video clips, on the other hand, are recorded on a CD-ROM at the data-playback speed specified by the software developer. Most full-motion video clips on current CD-ROMs are recorded at 2X (300 K/sec). The video clips don't play any faster or better if you use a 4X or 6X CD-ROM drive.

The High-Speed Future

Sources in the competitive CD-ROM publishing world are reluctant to speculate about when software optimized for 6X drives will become generally available. But a Plextor spokesperson said that higher-speed drives will stimulate software availability: CD-ROM titles with 4X video could arrive by fall. Wide availability of 6X-optimized titles isn't likely for a year or more.

Faster video exacts a price in disc space. Alan Finke, director of mapping and special projects for Compton's New Media in Carlsbad, California, says video

Digital Video: More Standards, More Confusion

Remember the great VHS-versus-Beta VCR battle of the early eighties? Two schemes for digital video on CD-ROMs may stage a similar standards battle—although the stakes will be even higher since both entertainment media and computer storage formats are involved.

Two digital video disk (DVD) proposals—one from Toshiba and Time Warner, the other from Philips and Sony—both boost CD-ROM capacity from 650MB to many gigabytes. Neither technology will work with your existing CD-ROM drives, but the Philips/Sony scheme will read current CD-ROM media.

Toshiba and Time Warner's plan calls for a two-sided CD-ROM that holds 5GB per side. Philips and Sony, who introduced the original CD standard in 1982, propose a standard using two disc sizes and multiple layers of data on a single side. This design packs 7.4GB on a 5-inch disc and 2.3GB on a 3-inch disc.

DVD's short-term focus is movies, which is why it's being touted by entertainment giants (and competitors) Time Warner and Sony, both owners of Hollywood studios. The DVD format holds up to 270 minutes of MPEG-2–compressed full-screen video and delivers it at five times the speed of a 6X CD-ROM.

Hardware and software for both DVD types should start appearing in 1996. Pricing isn't yet known. Carl Lehmann, director of interactive media and electronics at BIS Strategic Decisions, predicts it will be "at least two to three years" before either DVD standard makes a market splash. "They won't obsolete current CD-ROM technology, which has a nice life through 1999 at least," he says.

ILLUSTRATION: GORDON STUDER; PHOTO: JOHN GREENLEIGH

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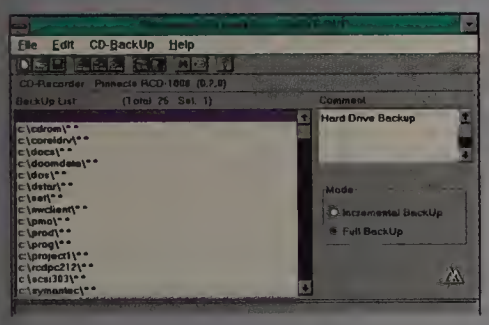

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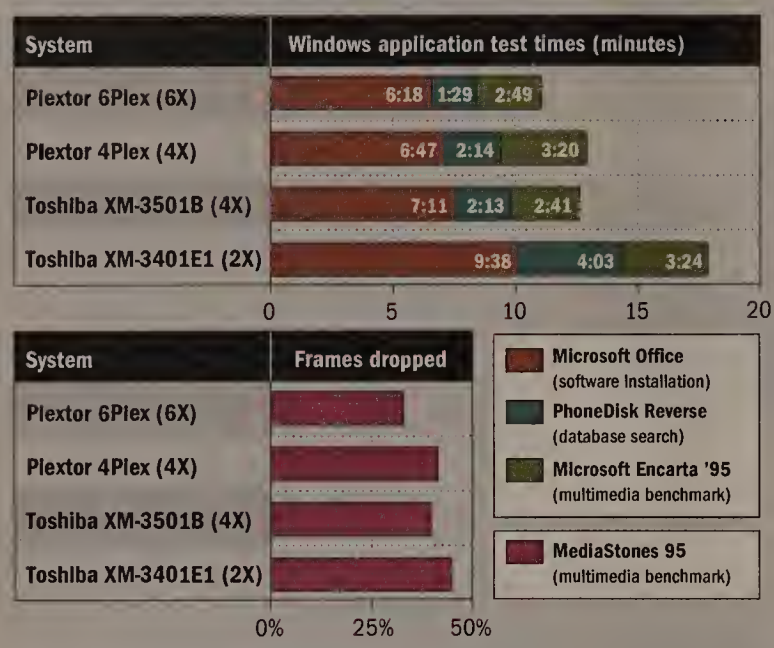
TEST REPORT

Plextor 6X CD-ROM Takes Performance Laurels



Shorter bars indicate better performance.
Data based on tests designed by PC World Test Center and P&B Inc., creator of MediaStones 95.

Plextor's 6Plex CD-ROM drive excels at data-intensive operations but runs multimedia at the same rate as slower CD-ROM drives.

clips in Compton's Multimedia Encyclopedia are recorded at 1X. The encyclopedia's large text database simply leaves no space on the 650MB disc for faster video.

Should you opt for a 6Plex drive? Certainly, if you want state-of-the-art performance right now. It's an investment for the future, too; but remember, 6X prices will eventually fall. For business use, where CD-ROM applications tend more toward databases than multimedia, the 6Plex can increase productivity immediately. And in a LAN environment, the faster access and transfer rates of a shared 6Plex boost overall network throughput.

The Competitors

Even though Plextor was first out of the gate with a 6X drive, it faces quick competition. NEC announced a 6X drive in May. The NEC 6Xi (internal) and MultiSpin 6Xe (external) drives are expected to sell for $500 and $600, respectively, comparable to what you'll pay for the Plextor. Plextor still sells a 4X drive, but NEC is moving exclusively to 6X—a strategy likely to speed the availability of 6X-optimized video software. As an industry leader, NEC can risk such a bold step.

Wearnes Peripherals has announced a 6X IDE drive, expected to ship in June, for a remarkable $400 street price. Toshiba, another industry leader, declined comment for this story but is expected to enter the 6X fray quickly. Other companies are sure to follow. Clearly 6X drives are the coming order of the day, but even as the industry adopts this latest high-speed standard, engineers are hard at work on 8X drives and beyond.

—Stan Miastkowski

Plextor 6Plex

The first 6X CD-ROM drive offers immediate speed for data applications and a fast future for motion video.
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Executive Suite — Help for Plotting Business Strategy

The right software can help turn a business around, says Charlie H. McLean, owner of One Hour Delivery Service in Dallas/Fort Worth, which transports documents such as legal and real estate papers. McLean and his partners pulled the business out of a three-year slump, thanks in part to suggestions from Business Insight. This $495 Windows program uses a knowledge base of management strategies to analyze an existing or proposed business, then suggests improvements.

"You're able to give people a basis under which to learn strategic thinking," McLean says. He uses Business Insight 4.0 to investigate the wisdom of possible acquisitions, while his managers use it for ongoing business and marketing planning. A new 4.0 version of Business Insight was scheduled to ship by the end of April. McLean, a beta tester, says it's easier to use than its predecessor.

Business Insight builds on information gathered from the work of business gurus. The user answers 500 questions covering everything from finances to management style and advertising. (You don't have to answer every question.) The program analyzes the data and generates a report rating the company on areas such as product positioning, competition, and profit potential. It helped McLean decide to expand services and add locations.

Business Insight 4.0 adds updated business advice. Simplified screens make it easier to work with, says McLean, a beta tester. Better charts and graphs help illustrate new ideas quickly, and integrated word processor and spreadsheet modules have more power. "This product helps us shape good ideas," he says. Business Resource Software, 800/423-1228. Reader service no. 829

PHOTO: REID HORN

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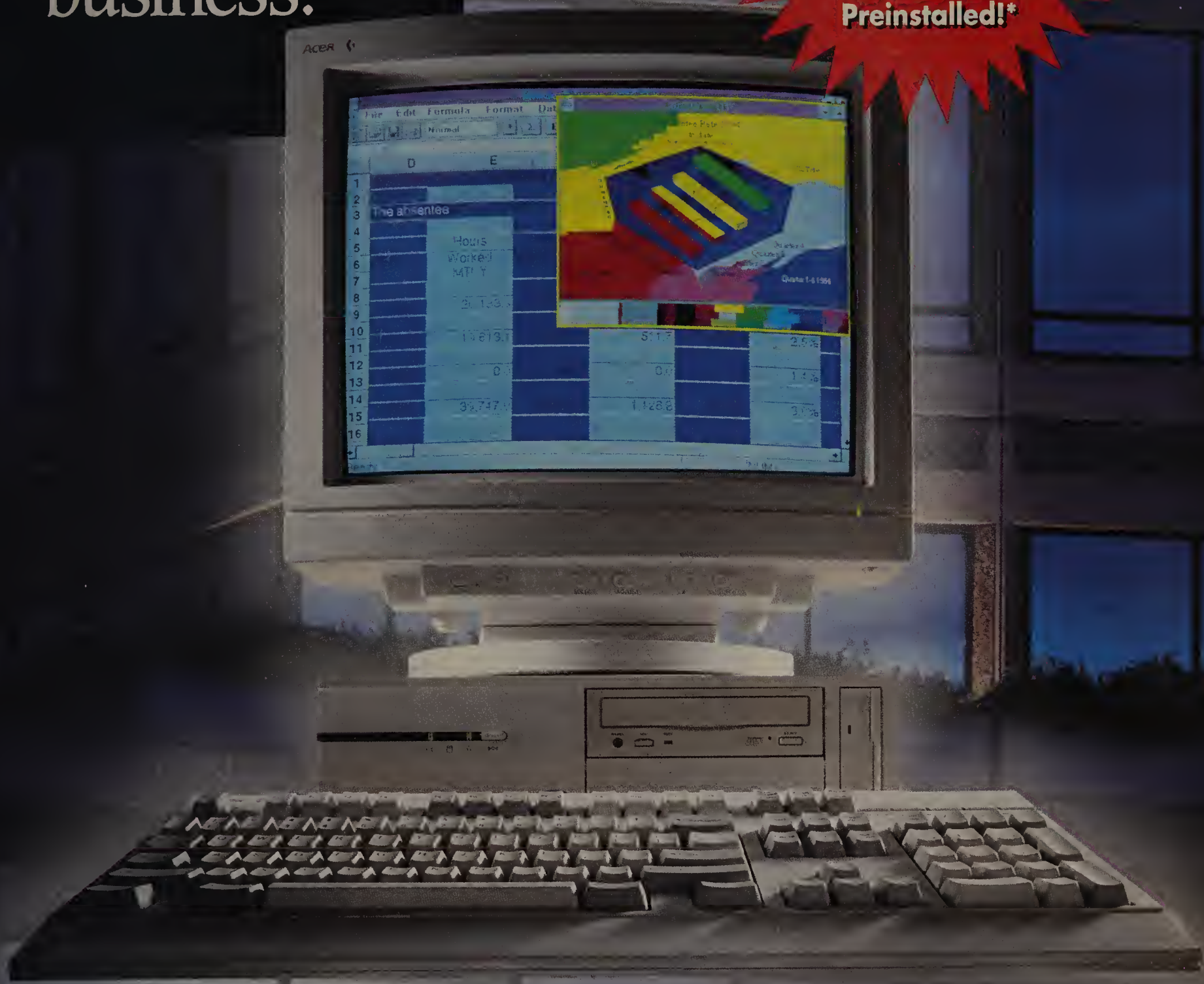

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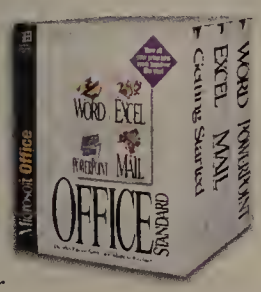

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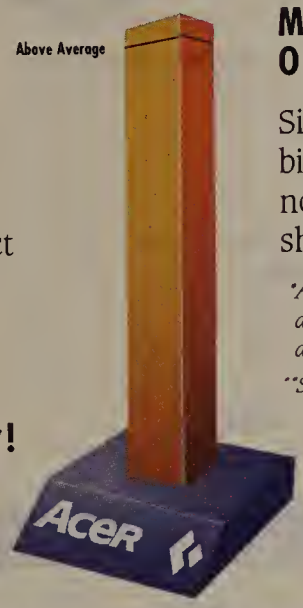

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AT&T Globalysts: Reach Out and Page Someone

When you hear somebody say "AT&T," you think *telephones*, right? While the communications giant hasn't exactly been a trendsetter in the desktop PC business, it's trying to change that image with its latest line of Globalyst desktop PCs that integrate such communications tools as business-conferencing and paging software.

Targeted at both home and business users, the Globalysts have the features you would expect in a standard desktop. The 300 (home) and 600 (business) models offer you a choice of a 75-MHz, 90-MHz, or 100-MHz Pentium processor. Prices range from $1599 to more than $4000.

We tested a preproduction Globalyst 630 with a 100-MHz Pentium, 16MB of RAM, a 1GB hard drive, 256K of secondary cache, 2MB of video RAM, and a 17-inch monitor. The 630 scored about average in its class on our Windows application tests. With a street price just over $4000, the 630 came with a quad-speed CD-ROM drive, a 16-bit stereo sound card, and a 14.4-kilobits-per-second (kbps) fax-modem.

But what differentiates the Globalysts from the rest of the desktop pack is their communications software. The 600 business series comes standard with AT&T's Vistium Share collaboration software, which allows users to share applications and data files across a modem or LAN connection. The 600 models also feature AT&T's MailFlash software, which lets business travelers have important E-mail messages forwarded to their alphanumeric pagers. For example, you could configure it to forward only messages from your boss on a specific topic. Both the 600 and 300 models include AT&T's MessageFlash pager software that lets you send an E-mail message from your desktop to another person's alphanumeric pager. (To use MailFlash and MessageFlash, you must subscribe to a paging service such as SkyTel.)

Although the 600 series Globalysts don't come standard with a fax-modem, the 300 series home units include AT&T's Personal Communications Center software and a fax-modem that transmits data at 19.2 kbps and faxes at 14.4 kbps. Designed for the home office, the Communications Center software acts as an electronic receptionist, enabling you to set up multiple voice mailboxes for incoming calls and a universal in-box for organizing fax, voice, and E-mail messages.

—Arden M. Hoffman

COMMUNICATIONS CAPABLE: AT&T's latest series of Globalyst desktop PCs features generous software bundles.

Globalyst 300 and 600 series

Desktop PCs with helpful communications features.
AT&T Global Information Solutions
800/447-1124
Street price: $1599 to over $4000
Reader service no. 750

Little Tape, Big Storage

Backing up to tape is a great way to protect against data loss. Travan, a new technology developed by 3M, sets higher-capacity formats for tape backup—uncompressed capacities of 400MB, 800MB, and 1600MB per tape, and about twice that much with software compression. Like popular QIC-80 drives, these Travan units use the floppy controller on your PC.

Hewlett-Packard's Colorado T1000 internal model is the first Travan tape drive to hit the market. Street-priced under $200, the T1000 holds 400MB of uncompressed data (800MB compressed) on a single minicartridge. As a bonus, if you already have a QIC-80 drive, such as a Colorado Jumbo 250 or 350, the T1000 can also use your QIC-80 tapes at their rated capacity.

We found the T1000 a snap to set up using HP's included cable that plugs into the floppy controller (there's an extra connector for the floppy cable). And unlike previous HP Colorado products, the T1000 fits into a 1-inch-high externally accessible drive bay. HP includes its capable, easy-to-use Colorado Backup software.

Expect to see additional Travan tape drives soon from Conner, Iomega, and Rexon. By this fall, HP and other vendors will likely ship the higher-capacity Travan drives.

—Richard Overton

HP Colorado T1000

First tape drive to use the Travan backup format.
Hewlett-Packard Co.
800/810-0133
Street price: $199
Reader service no. 751

Rolling Rodents and Marching Mice

In their ongoing race to build a better mouse, Logitech, Key Tronic, and Mouse Systems have added an unusual twist or two to their latest input devices.

With Logitech's new TrackMan Vista trackball, you move the cursor around with your index or middle finger rather than your thumb. Key Tronic's LifeTime Mouse scurries on two "optomechanical feet" instead of relying on the more traditional ball. And Mouse Systems' ProAgio device has no fewer than five mouse buttons, including a roller button that lets you scroll through windows automatically.

Green Eggs and Mice

With its aquamarine trackball and blobby, humpbacked body, Logitech's TrackMan Vista looks like a fried egg from a Dr. Seuss book. The trackball is positioned at an upper, forward angle, allowing you to manipulate it with your index and middle fingers. The main button is positioned near the thumb; the second and third buttons lie to the right of the ball. While the TrackMan Vista is designed to improve hand support, I found the trackball's height and angle slightly uncomfortable.

FRIED-EGG POINTER: You maneuver TrackMan Vista's aquamarine trackball with your index or middle finger.

Aside from its offbeat design, the TrackMan Vista is easy to use, with good programming capabilities. Using its straightforward set-up software, you can assign any of some 30 functions to the second and third buttons, including page down, page up, cut, copy, and paste.

A Mouse With Feet

The optomechanical feet on Key Tronic's LifeTime Mouse look like two loosely sewn buttons; they're designed to make the mouse more accurate and more flexible in its movement. While it does glide freely, even without a mouse pad, the LifeTime Mouse didn't make my pointing and clicking noticeably more precise.

LifeTime Mouse ships with two additional snap-in parts that change its button configuration. If you prefer a three-button mouse, for instance, just pull out the two-button part and slide in the three-button replacement. And southpaws will like the piece that configures the buttons for lefties: The large main button is on the right rather than in its traditional left position.

While the LifeTime Mouse is compatible with Windows applications, its configuration software runs only in DOS. And the software doesn't let you assign shortcut functions to the second and third buttons.

ROLLING, ROLLING: ProAgio's roller button lets you scroll through text in a window without having to click inside the scroll bars.

Roll On, Rodent

Mouse Systems' ProAgio fits easily, if uncomfortably, under the average palm and has a cord long enough to use as a jump rope. But the ProAgio's key attraction is its roller button—the PC equivalent of a car's cruise control.

Located on the top middle section of the mouse, the ProAgio's roller button lets you scroll through text in a window without having to click inside the scroll bars. Place your middle finger on the button, roll the button in either direction, and the window scrolls accordingly—no need to press or click anything. It's not a huge advantage, but if you're feeling twinges of repetitive strain injury, every point and click saved is appreciated.

You can configure the roller button to scroll automatically through windows line by line, page by page, up or down, left to right, and so on. You can also program the middle and right buttons to perform a number of shortcuts. Best of all, you can assign specific button settings to an application. (When you load the app, the ProAgio's software enables the shortcuts.)

The ProAgio offers more features than you might want. But if you need maximum flexibility, this is the mouse for the job.

—James A. Martin

LifeTime Mouse

Two-button mouse can be configured with three buttons.
Key Tronic Corp.
800/262-6006
List price: $49
Reader service no. 752

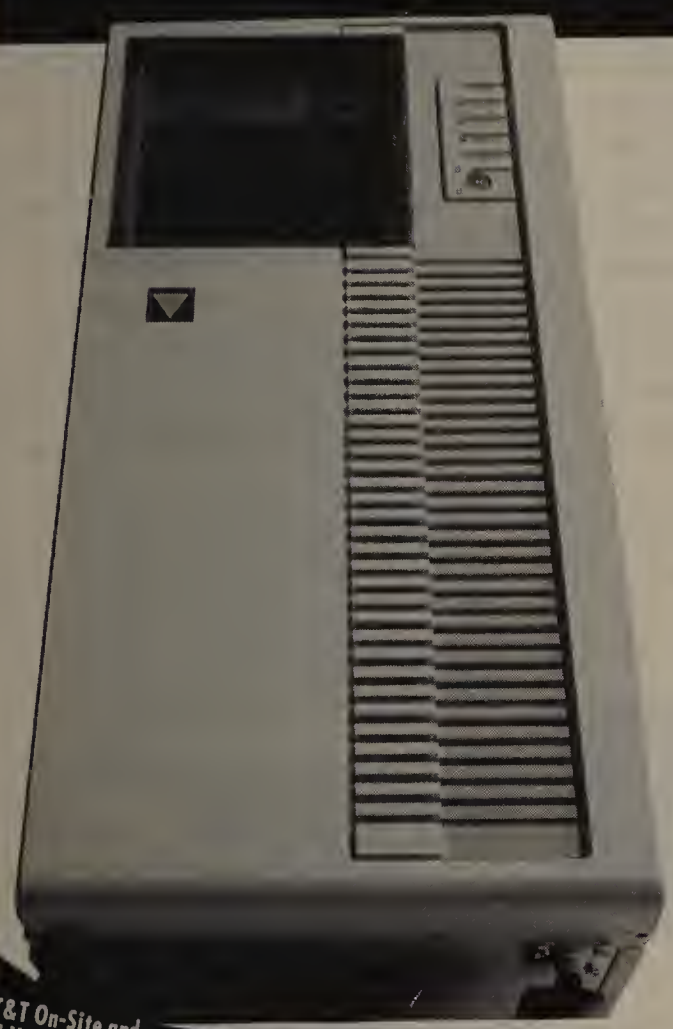
ProAgio

Five-button mouse with auto-scrolling talents.
Mouse Systems
800/886-6423
List price: $59.95
Reader service no. 753

TrackMan Vista

Three-button, finger-manipulated trackball.
Logitech
800/231-7717
List price: $99.95
Reader service no. 754

TOWER POWER



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#9 Imagine 128 Bit Graphics 4 MB VRAM
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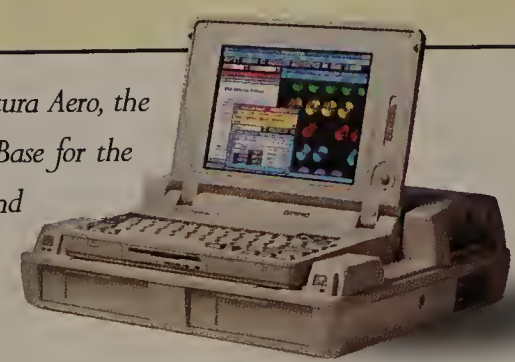

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Canon's Stylish Color Ink Jet Goes Portable

When I first saw its small and stylish black case, I thought the Canon BJC-70 was a new multimedia kit designed to appeal to the Sega crowd. Indeed, this portable color ink jet looks incredibly sleek. It weighs a mere 3.1 pounds and measures 2 inches high, about 11 inches long, and 6 inches wide. You've carried hardcover books that are bigger than this printer.

Its innovative design makes the BJC-70 a good choice for home offices and for students. It occupies very little desktop space, and you can easily stash it in a briefcase, drawer, or closet. And at $359 on the street, the BJC-70 falls in the same price range as bulkier ink jets. Canon also produces a monochrome model, the BJ-30, for about $259.

The BJC-70's output quality is on a par with that of most ink jets: 360-by-360-dpi resolution in color, 720 by 360 in monochrome. As with any ink jet printer, the best color output requires coated paper. Color pages print at almost 1 page per minute, monochrome pages at up to 4 ppm.

The preproduction unit I tested produced impressive business letters, memos, charts, and similar documents. In fact, the only substandard results occurred when I printed overhead transparencies; they often contained runny-looking letters and missed spots of color. Unfortunately, most ink jet printers still don't do a great job with transparencies.

For travelers, the Canon BJC-70 comes with a rechargeable battery that powers the printer for up to 200 pages. A thin top cover pops up to reveal a paper feeder that holds 30 sheets or five envelopes.

If the BJC-70 is the shape of printers to come, I like what the future holds.

—Laurianne McLaughlin

PRINTER OR CD PLAYER? Canon's stylish BJC-70 is a portable color ink jet printer that's compact enough to fit on any desktop.

Canon BJC-70

Lightweight, inexpensive color ink jet.
Canon Computer Systems
800/848-4123
Street price: $359
Reader service no. 755

HP ScanJet 3c Sets New Highs for Color Scanners

I'm starting to sound like a broken record. Every time I write about a new Hewlett-Packard scanner or printer, I end up saying that it sets a new standard in its category. Looks like I'm going to continue the monotony with the ScanJet 3c. This color/gray-scale flatbed scanner replaces the 2cx; for the same $1179 list price, it delivers features and abilities previously available only in high-priced professional units.

Sure, you can buy a color scanner for much less; I saw one recently for $449 at my local warehouse store. But let the buyer beware: Low-end scanners are rife with compromises. That bargain-priced "1200-dpi" scanner is often a 150- or 300-dpi unit that uses software to extrapolate scanned images to a higher resolution—unacceptable for serious graphics work. But HP's new 3c is a true 600-dpi scanner that delivers ultrasharp scanned images. (Yes, it can extrapolate images, too—up to 2400 dpi.)

The 3c's other breakthrough feature (unique in this price range) is 30-bit color scanning. While 24-bit, 16.8-million-color scanning is fine for most applications, 30-bit technology allows considerably more detail in hard-to-scan areas such as shadows in photographs. The combination of true 600-dpi resolution and 30-bit color is especially important if you enlarge scanned images.

Installing the 3c is a breeze. It comes with a SCSI add-in card that automatically finds available I/O port addresses in your PC, eliminating a common cause of installation woes. (You can also plug the 3c into an existing SCSI adapter, as long as it's CAM or ASPI compatible, as most are.)

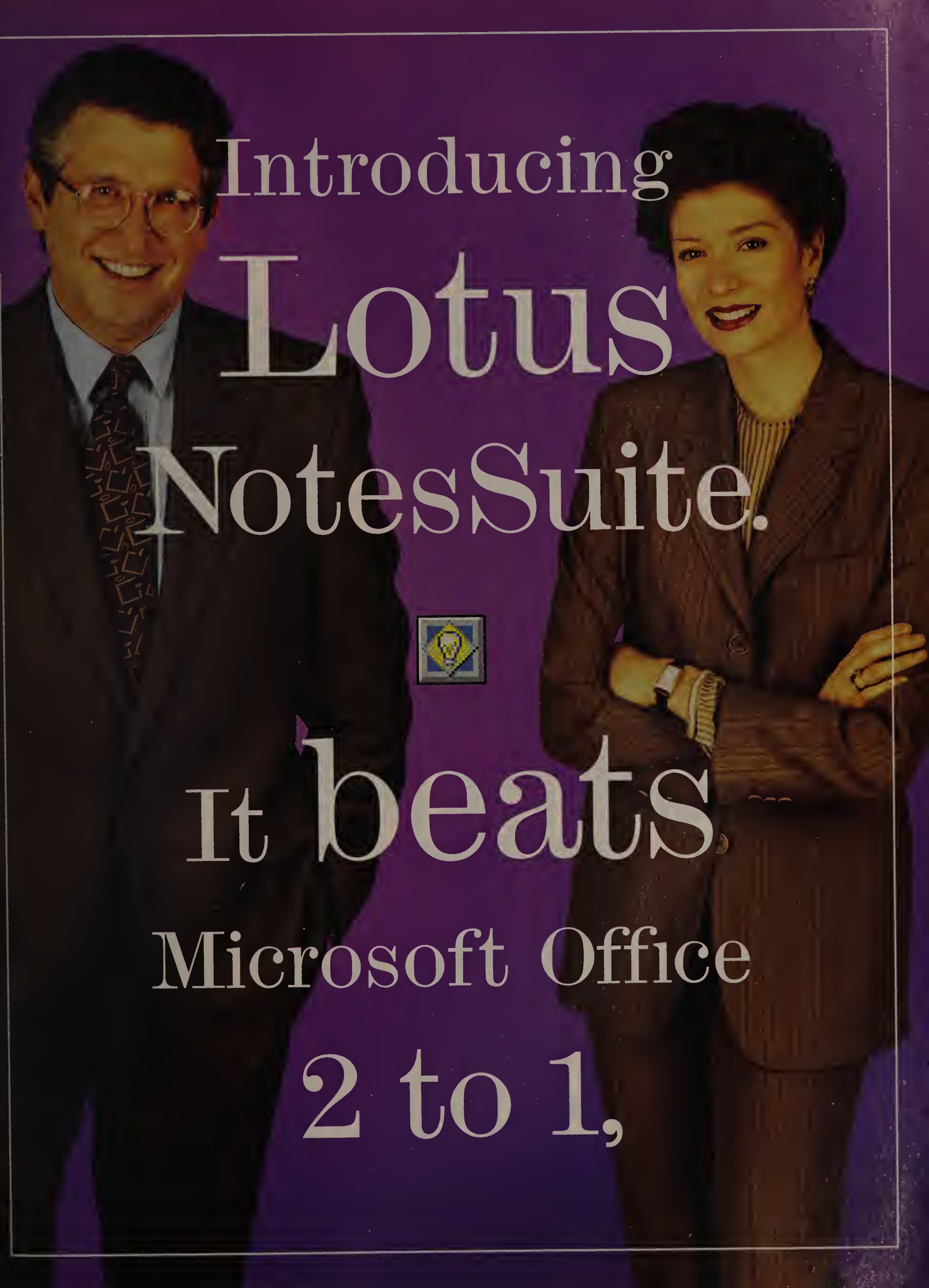
Since the 3c is TWAIN compatible, you can scan images directly into your favorite TWAIN-compliant graphics applications.

I found the ScanJet Copy utility eminently practical. As the name implies, it lets you use your scanner and printer as a copier. A single mouse click scans the image and sends it directly to the printer or fax card. Imagine the possibilities if you have a color printer.

—Stan Miastkowski

HP ScanJet 3c

True 600-dpi, 30-bit color scanning at a breakthrough price.
Hewlett-Packard Co.
800/722-6538, 208/395-2551
List price: $1179
Reader service no. 756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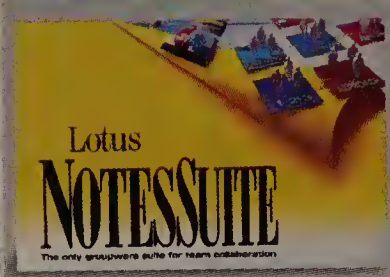

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In Canada call 1-800-GO-LOTUS. †$299 per user license for Lotus NotesSuite Desktop. Minimum purchase of fifty licenses required. ††Source: "Lotus Notes: Agent of Change," International Data Corporation, 1994. The World Wide Web address: http://www.lotus.com. *©1995 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Working Together, Lotus Notes, SmartSuite, 1-2-3, Ami Pro, Approach and Freelance Graphics are registered trademarks and NotesSuite, Organizer and Notes/FX are trademarks of Lotus Development Corporation. Microsoft is a registered trademark of Microsoft Corporation.*

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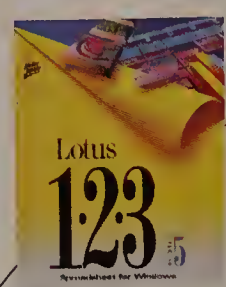
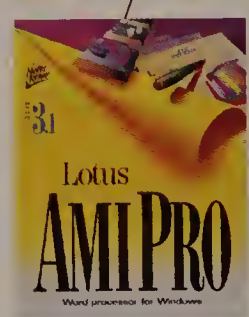
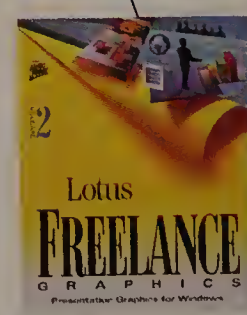


Create a database in Approach to track sales and inventory, manage projects and contracts, and analyze and report on data. And everyone on your team will have instant access to what's going on.

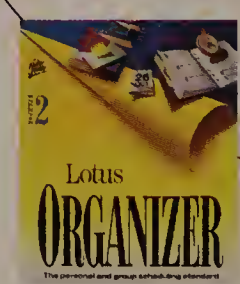
Reduce paperwork and automate work flow by creating a report in Ami Pro using information stored in your 1-2-3 spreadsheet. Route it for approval automatically and track progress with your Notes application.

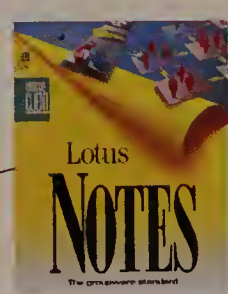




Use Freelance Graphics to develop presentation materials for discussions or sales meetings. Then store them in a Notes database, so that everyone can access them anywhere or anytime.

Lotus Organizer with group scheduling makes it fast and easy to set up meetings with anyone on your LAN or WAN. It gives you real-time access to your team members' schedules, so you can instantly see who's available and when.





Lotus Notes is the groupware standard that lets people share and access information and ideas across teams, across companies, around the world. This new level of communication and collaboration has proven so effective, companies using Lotus Notes have averaged nearly 200% annual return on investment.††

NotesSuite is the only integrated suite of products for group collaboration. With NotesSuite, information can be shared seamlessly between Lotus Notes and all five Lotus desktop applications, giving you an efficient new way to store, organize, share and collaborate across the organization. And, NotesSuite comes with 10 built-in applications you can use as is, or customize, to take advantage of the unique integration between Lotus Notes and SmartSuite. So put NotesSuite to work for your company today, for as little as $299.† For free trial versions of all the Lotus products, just call 1-800-TRADE-UP, EXT. A713* for the new Lotus Product Gallery CD.

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ASAP
800-248-ASAP

Sidekick's Serious Glitch Mars This Low-Cost PIM

Sidekick 2.0 for Windows, a personal information manager from Starfish Software, will likely appeal to small-office and home users who want a simple, no-fuss PIM. Unfortunately, Sidekick suffers from a serious flaw that could prove disastrous if you're upgrading from Sidekick version 1.0.

How serious? According to Starfish Software, a flaw in version 1.0 can corrupt some data files. When you try to open these files in version 2.0, you could lose all your calendar data—including valuable business appointments and other essential information. (One *PC World* editor experienced this bug firsthand; Sidekick destroyed his version 1.0 data files and filled 90MB of his hard drive with worthless junk data. Starfish Software was unable to help him recover the information.) Starfish advises upgraders to back up version 1.0 data files before opening them in version 2.0. The company makes this warning in the read.me file.

Despite this serious bug for upgraders, Sidekick has some redeeming qualities. Version 2.0 is the first product from Starfish Software, a new company founded by the former Borland CEO Philippe Kahn. Starfish recently purchased Sidekick from Borland and is now shipping it.

The program takes a minimalist approach to contact management. Its main charms are its affordable $49 street price ($30 for the upgrade) and its small 3MB installation size. Sidekick 2.0 includes calendar, card-file, and notepad features; the interface looks very much like the paper-based DayTimer organizer.

What's new in Sidekick? Mostly ease-of-use features, such as balloon help and improved drag-and-drop capabilities. Sidekick's Cardfile contacts module lets you keep more than one phone book open at once—helpful if you have separate personal and business listings. On the calendar side, you'll find a colorful new calendar, which you can view in daily, weekly, monthly, or yearly format. A new graphic pattern pops up for each month. And for workaholics, Sidekick's calendar now supports overlapping appointments.You may also schedule recurring appointments.

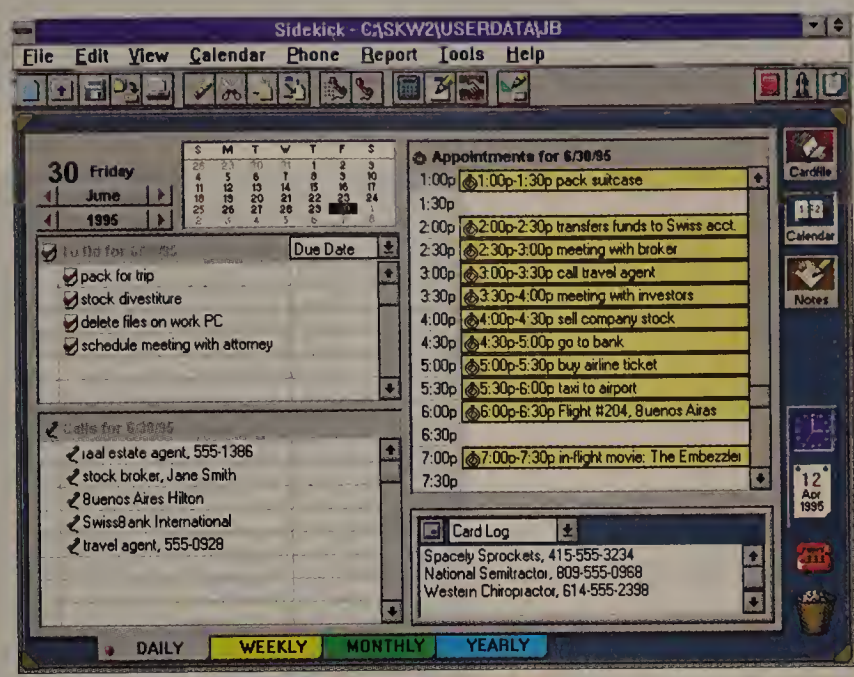
It's easy to work with the Sidekick modules separately, or if you prefer, you can view everything in one daily calendar screen that packs in to-do's, calls to make, appointments, and card-file entries.

Sidekick also supports Caller ID service (provided this service is legal in your state.) With a Caller ID device, you can set up Sidekick so contact records pop up as a call comes in, before you ever pick up the phone.

—Laurianne McLaughlin

Sidekick 2.0 for Windows

PIM for small-business and home users.
Starfish Software
800/370-8963, 408/439-0942
Street price: $49, upgrade $30
Reader service no. 815



SIDEKICK 2.0 FOR WINDOWS provides a simple, no-fuss approach to contact management. But a bug could spell trouble for upgraders.

A DOS Tool for Investors

When it comes to investment software, you have to ask yourself if a program's benefits outweigh the trouble of using it. Design Creations' $59.95 Individual Stock Investor 3.0 is a textbook case of this dilemma. It promises a robust platform for building an investment strategy—a good start. But as it's a DOS program, interactivity with other applications is severely limited.

Nevertheless, the product does address the core concerns of today's investor. Rather than paying steep online charges to research electronic financial databases, you use Individual Stock Investor to manage your portfolio and build databases tailored to your investment strategy. The program lets you download news reports, company profiles, stock prices, and other data from a variety of sources, including the Prodigy and CompuServe online services and Standard & Poor's disk-based stock market report.

You can analyze your portfolio using a variety of investment strategies. But the documentation doesn't explain how to import data from the program's financial databases into your portfolio, and there's no menu command for this option. And since this is a DOS app, you can't cut and paste your research into other programs.

—Joe Abernathy

Individual Stock Investor 3.0

DOS investment management program.
Design Creations
800/933-5910, 209/532-8413
List price: $59.95
Reader service no. 816

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intel inside

How did we do it? By packing a ton of features and performance into a surprisingly economical notebook. Including a removable floppy drive that accommodates a second battery. An easy-to-use integrated trackball. A vivid 9.5" dual scan color display. Just about everything you probably thought you couldn't afford. And the 75MHz model is now just $2299.

At the same time, *PC Computing* named the Dell Latitude XP™ winner of its grueling Notebook Torture Test. But not before they baked it, froze it, poured hot, sugary coffee on its keyboard, and dropped it – the death blow for ordinary notebooks.

PC Computing's verdict: "The

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WIN.

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Bookkeeping Basics for Budding Businesses

If your small business has outgrown that shoe box of records, you needn't move up to a suitcase. Consider graduating to Peachtree First Accounting 1.0. This more basic version of Peachtree Accounting for Windows doesn't overwhelm you with hundreds of financial options. Rather, it provides the bare minimum of accounting essentials needed for most budding enterprises.

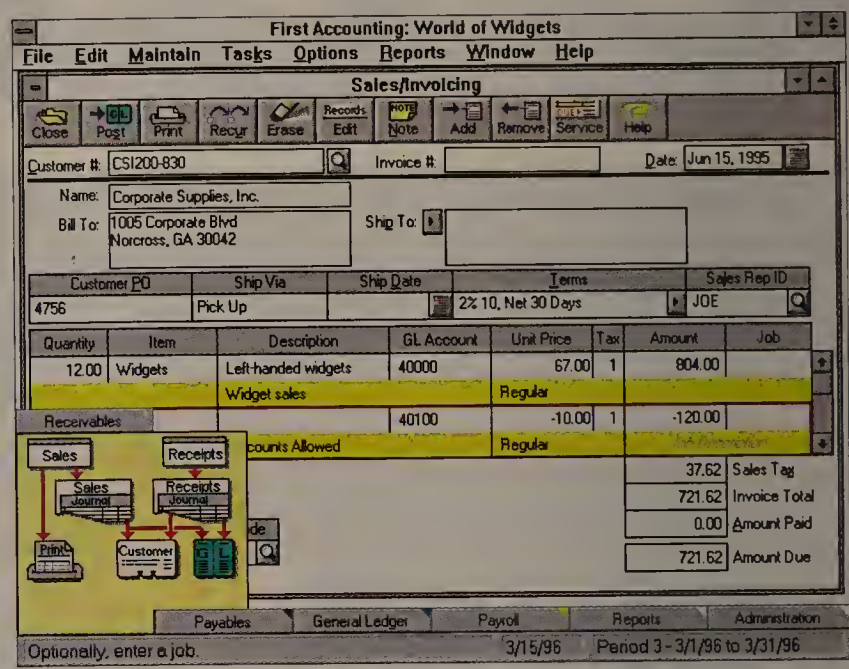
First Accounting is an easy-to-use $49 package that concentrates on helping you invoice customers and pay your bills. It also assists in cash management and project control. Since the program is aimed at neophytes, it includes extensive online help, such as Smart Guides that walk you through bookkeeping procedures.

Starting up your company's books is a snap. You select from one of 60 accounting templates designed for small businesses ranging from a day care center to a cemetery. Next, you follow the setup checklist: Simply click on successive items in the list to organize your financial records step-by-step—customer names and addresses, unpaid invoices, and so on.

Some companies may find that First Accounting doesn't go far enough. For example, you can maintain a price list of inventory items, but you can't keep track of quantities in stock. Similarly, while the program lets you print payroll checks, you'll have to calculate the deductions on your own.

When you're ready to advance from First Accounting to your second bookkeeping package, it's easy to upgrade to the feature-rich Peachtree Accounting for Windows. Both programs have the same file format and a number of common menus.

—Richard Morochove



ACCOUNTING FOR BEGINNERS: Peachtree First Accounting's pop-up flowchart shows the sales and invoicing process.

Peachtree First Accounting 1.0

Accounting for fledgling businesses.
Peachtree Software
800/228-0068, 404/564-5800
Street price: $49
Reader service no. 817

UnInstaller 3 Zaps the Apps That Waste Disk Space

With the introduction of UnInstaller 1.0 in 1992, MicroHelp invented a new category of software—a Windows utility that deletes unused programs and stray files from your hard disk. Now MicroHelp pushes the envelope further with UnInstaller 3, which not only uninstalls Windows programs but also helps move applications to other directories or drives—even to another PC.

Like the spate of competitors that have followed it, UnInstaller has a bevy of tools for freeing up hard disk space. In addition to zapping unwanted apps, it can ferret out OLE objects and .ini, .dll, and other files associated with those applications—files that may be scattered across more than one directory. Street-priced from $35 to $40, UnInstaller can also find and delete unused fonts, video drivers, and megabyte-gobbling help, graphics, and sound files. It seeks and destroys duplicate and orphaned files left over from your previous attempts to uninstall programs manually.

This may all sound pretty destructive—and it can be. No uninstall program is foolproof. If you aren't careful, you can delete files needed to run important applications, or even Windows itself.

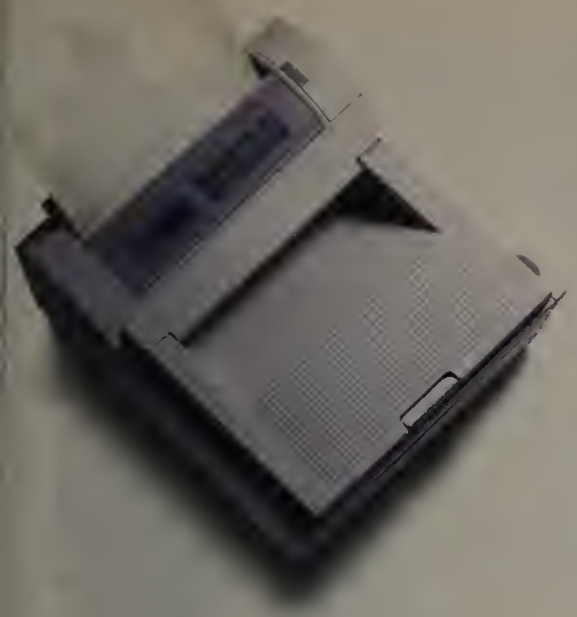
For instance, although UnInstaller's Windows Cleanup tool displays a list of files you supposedly can delete safely, only when you delve into the manual do you find sage advice on keeping original Windows installation disks, third-party fonts, and video drivers—just in case something goes wrong. Quarterdeck's CleanSweep 1.0 for Windows does a better job of providing on-screen warnings for unwary users (see "Clean Sweep Uninstalls Windows Programs Quickly," *New Products*, February).

UnInstaller does, however, offer handy tools to make uninstalling safer, including file viewers licensed from Systems Compatibility, maker of Outside In. Before deleting a word processor, database, spreadsheet, or graphics file, you can view its contents within UnInstaller to make sure you no longer need it.

—Reid Goldsborough

UnInstaller 3

Sophisticated uninstall utility for Windows 3.1.
MicroHelp
800/777-3322, 404/516-0899
Street price: $35 to $40
Reader service no. 818



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"This straightforward 300 x 300 dots-per-inch model was our testers' top choice."

"Testers gave the OL400e high marks for its print quality for text (A-), its quiet operation (A) and performance (A-). And they really liked its...price."

— *Home PC 1/95*

"...speedy printing and good print quality in a compact package."

"...the OL400e matched the competition head on."

"The Okidata OL400e offers you low cost and good speed..."

"Tough to beat."

"For compactness and excellent through put, the OL400e distinguishes itself."

— *Computer Shopper 3/94*

"provides laser-quality output at a low price." — *Home Office Computing 2/94*

"Best Of The Breed"

"...produces crisp text and graphic documents." — *PC Today 2/94*

"Wonderfully compact and quiet. Call it the Bargain of the Year."

— *PC Week 12/20/93*

"...buy one and your printer woes will be gone." — *Computer Shopper 12/93*

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"...better performance and one of the lowest

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"A full 20% faster than the average 100-MHz Pentium system."
PC World, February, 1995

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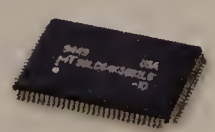

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"The Millennia is nothing short of the best all-around PC available on the Market today."
PC Magazine, April 25, 1995

PC MAGAZINE

PC Magazine Labs tested the leading 100-MHz Pentium desktop systems and came up with an "unprecedented Winstone 95 benchmark score for the Micron P100 Millennia." The numbers clearly tell the Micron story.

intel inside pentium PROCESSOR

Higher Score Represents Better Performance	WINSTONE 95 (Score)
MICRON P100 MILLENNIA	177
Dell Dimension XPS P100	150
Gateway 2000 P5-100XL	145
HP Vectra XU5/100C	161
IBM PC 750-P100	163

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IBM	8.2	7.6	7.4	6.5
COMPAQ	8.4	7.7	7.7	7.4
HP	8.4	7.8	7.7	7.1

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In PC Magazine's latest Service and Reliability survey, Micron received the highest scores in all four categories: Satisfaction with Reliability, Satisfaction with Repair Experience, Satisfaction with Technical support, and Future Likelihood of Buying. (PC Magazine, January 1995.)

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Circle 57 on reader service card

MapLinx 3.0 for Windows: Mapping for the Masses

High prices have limited the popularity of PC mapping software. But MapLinx Corporation is determined to change that with MapLinx 3.0 for Windows, an affordable program for sales, marketing, and service professionals. Sales and marketing types can use the $149.95 MapLinx to plan trips and target leads, while operations and service folks can use it to analyze where their customers are.

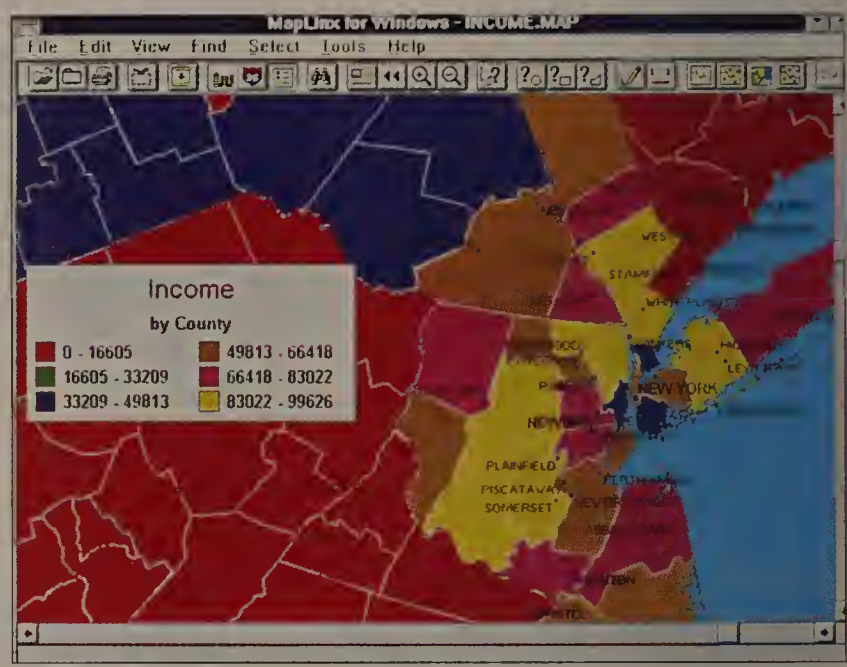
When you launch MapLinx, a map of the United States appears on your screen. By placing your mouse pointer anywhere on the map and clicking the left mouse button, you can zoom in on a specific area. In mileage mode you "connect the dots" between points on the map, and the program automatically gives you the mileage for the fastest route.

MapLinx displays major U.S. and state highways and more than 27,000 cities, though it lacks detailed city street maps. It can show zip codes, too. Choose the zip code option from the menu bar, and the numbers appear on the map. You can enhance this feature with two add-on packages: Locate ($29.95) lets you choose a zip code, county, city, or area code and zoom to that region of the country; and Zip Code Boundaries ($99.95) shows the boundaries of zip code zones.

Version 3.0 can run on a LAN and includes updated road information, plus more symbols and improved shading for color-coding states or counties. MapLinx can import records in popular file formats such as dBASE, Microsoft Access, and ASCII. It can also map important information with symbols.

The user-friendly MapLinx offers the power of computer cartography at a nice price.

—John P. Mello Jr.



MAPPING FOR LESS: The $149.95 MapLinx 3.0 for Windows is an affordable mapping program for business professionals.

MapLinx 3.0 for Windows

Affordable, easy-to-use mapping software.
MapLinx Corp.
800/352-3414,
214/248-2690 (fax)
List price: $149.95
Reader service no. 819

Let Boris Manage Your Documents

Spending too much time managing the clutter of files on your hard disk? Boris may be for you.

The $39 Boris, from StarBase Corporation, is a set of Windows assistants designed to simplify and automate day-to-day file management chores. It provides a file archiving tool that automatically saves old versions of your documents, a disk space monitor that alerts you when the hard disk is nearing capacity, and a disk cleanup assistant that erases unwanted files. Boris can even schedule other programs to run at user-specified times.

The file vault assistant is probably Boris's most powerful feature. Rather than saving multiple versions of a document (each with a different file name), you can use Boris to save old versions in the program's file vault—Boris lets you specify how many. For instance, if you tell Boris to keep the past five versions, the sixth revision will overwrite the first, and so on. You can even designate a version as permanent, so Boris will never overwrite it. Each version is numbered and dated, making it easy to access your earlier work. And if you're on a networked PC, Boris can create the file vault on a server, saving disk space on your desktop system.

The disk space monitor checks the hard disk at intervals you specify. If the free space on the disk drops below a certain percentage, a warning dialog box pops up: It's time to delete those extra font, sound, and GIF files that are hogging multiple megabytes.

Boris's disk cleanup assistant can automatically delete old, unused files and stray files left in temporary directories. You create a list of the directories and subdirectories you want Boris to examine, and you can also configure the program to search only for specific file extensions, such as .tmp.

I found Boris very easy to configure and use. Once I set it up, the program worked unobtrusively in the background. When I needed an old version of a file, I could easily summon the file vault assistant to retrieve it. If you work with a lot of documents, Boris is definitely worth a look.

—Jeff Noxon

Boris

Automates document and disk management.
StarBase Corp.
800/891-3262
List price: $39
Reader service no. 820

TeamFlow 4 Streamlines Business Processes

TeamFlow 4 for Windows is a $295 graphical flowcharting tool that helps workgroups analyze and redesign employee activities and work processes. Because it's easy to use and built for team activities, TeamFlow 4 can be an ideal tool for Total Quality Management workgroups that study current business processes and brainstorm new ones.

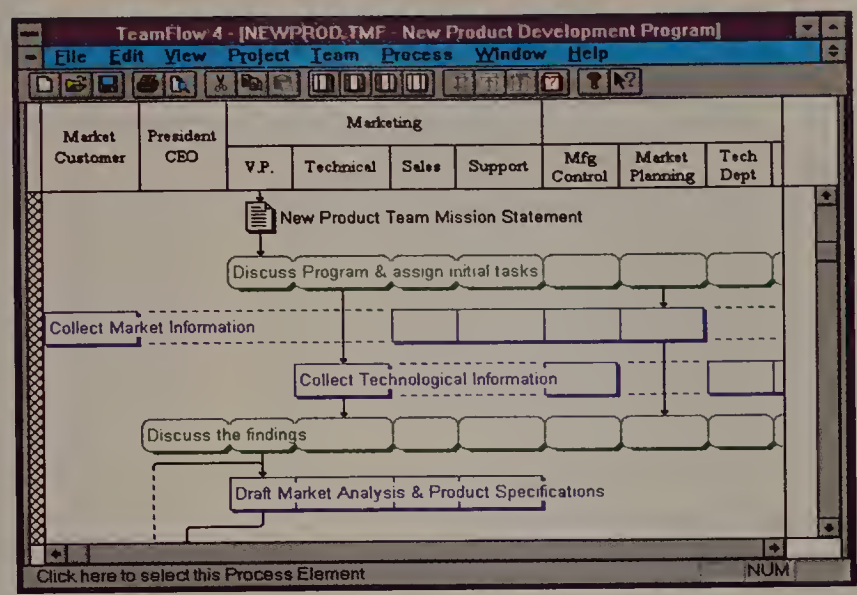
TeamFlow 4 for Windows

Helps workgroups redesign business processes.
CFM Inc.
617/275-5258
List price: $295
Reader service no. 821

CFM's TeamFlow 4 uses *deployment flowcharts* to depict work processes. Each work process is placed in a column that corresponds to the name of the person or department responsible for its completion. It's a convenient and graphical way to show how work flows among departments.

TeamFlow 4's charting techniques are simple to learn and use. You can share tasks and meetings among several individuals, and a single task in a flowchart can represent an entire lower-level flowchart.

Unfortunately, the program's additional features, such as cost and date tracking, are sketchily implemented. For instance, dependencies aren't tracked; when you change the completion date for a task, the program doesn't change the start and completion dates of subsequent tasks.



A TEAM PLAYER: TeamFlow 4 for Windows helps workgroups analyze and redesign business processes.

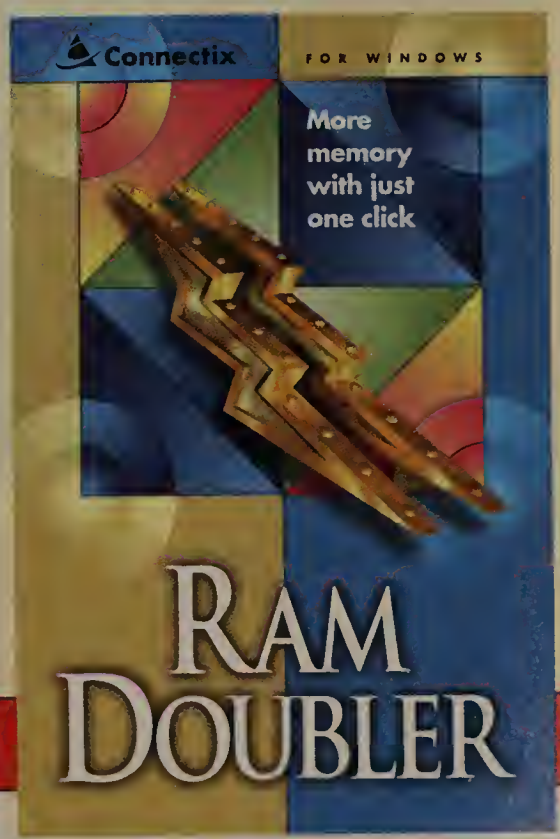
While TeamFlow 4 isn't a comprehensive planning tool, it can help workgroups improve business processes.

—Warren Sirota ▶

How Do You Run More Applications In Windows?

RAM Doubler For Windows.

Introducing RAM Doubler™ for Windows.® It's software that makes your existing RAM work harder. Forget about buying more memory. Adding more memory to a Windows system doesn't let you run more applications simultaneously. That's because Windows doesn't use your RAM efficiently. With RAM Doubler on your PC you'll get rid of the "insufficient memory" message forever. And you don't have to open your machine. Just run RAM Doubler's 15 second installation and you can run more Windows applications – instantly. Buy RAM Doubler for Windows today, your satisfaction is guaranteed. RAM Doubler is available at CompUSA, Egghead, Computer City and wherever great software is sold (SRP $99).



Connectix

System Requirements: A PC equipped with a 386, 486, Pentium or equivalent processor • Windows 3.1 or 3.11, Windows for Workgroups 3.1 or 3.11, running in 386 enhanced mode • 4 MB RAM required, 8 MB RAM recommended • RAM Doubler for Windows works in tandem with any DOS memory extender, such as QEMM or Netroom.

More Memory With Just One Click.

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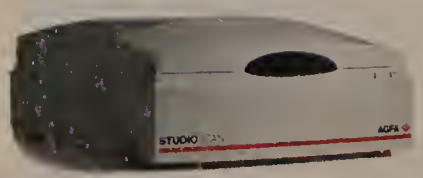
EMAIL: info@connectix.com • RAM Doubler is a trademark of Connectix Corporation. All other trademarks are the property of their respective holders.

Circle 86 on reader service card

Anderson & Lembke, Inc.

WHAT OUR ENGINEERS HAD IN MIND WHEN WORKING ON OUR NEWEST SCANNER.



Introducing the Agfa StudioScan II.

Push a button, make a scan. Is it really that simple? With the new Agfa StudioScan II, it can be.

That's because StudioScan II was designed for simple operation. Two levels of scanning software are built in — easy-to-use Agfa FotoSnap and comprehensive Agfa FotoLook. Plus, our exclusive, 42-page *Introduction to Digital Scanning* will guide you through the scanning process.

What's more, every StudioScan II comes complete with Agfa FotoTune color management software and our IT-8 reference target, along with Adobe PhotoShop™ LE and OmniPage Direct™ OCR software. All in a 400 x 800 ppi, 30-bit, one-pass scanner. And all for about $1,000.

So if you want an easy way to bring a scanner into your office, all it takes is the new StudioScan II. And your finger. Call 1-800-685-4271, ext. 2719 to find out more information on Agfa's new scanners.

AGFA Agfa
The complete picture.

AGFA and the Agfa rhombus are registered trademarks. Photoshop is a trademark of Adobe Systems Incorporated, which may be registered in some jurisdictions. Omnipage Direct is a trademark of Caere Corporation.

Circle 51 on reader service card

CD Cabin Brings Order to CD-ROM Chaos

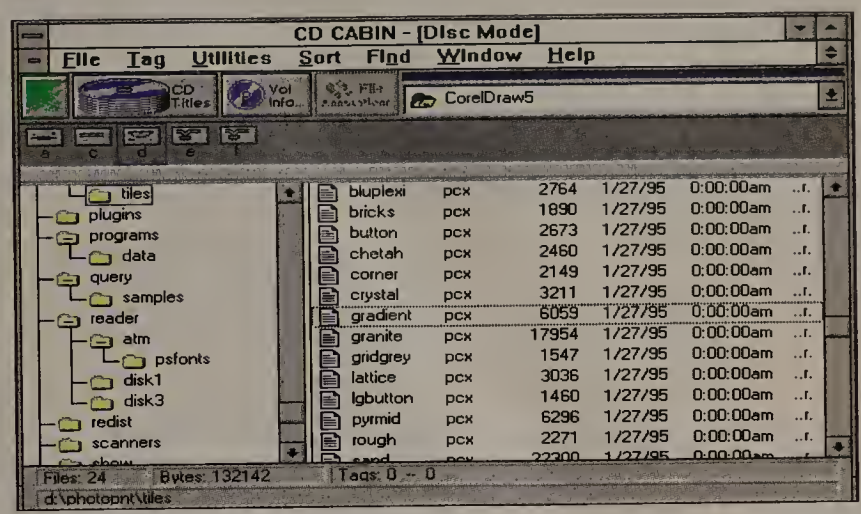
Between the Corel Stock Photo Library, the Photodisc library, and about 50 other CD-ROMs that feed my business presentations, at times I have trouble tracking down a specific image or sound file.

Several products address this problem, and a good one is The Aldridge Company's CD Cabin for Windows. This $99.95 utility creates a directory of your CD-ROM collection on the PC's hard disk. You can assign names to individual CD-ROMs ("Photo Library," "Clip Art," and so on) and browse a CD-ROM's vast labyrinth of directories without inserting the disc. CD Cabin also lets you link CD-ROM titles into logical groups. For instance, by linking all your CD-ROM disks that contain sound files, you can easily search for the right audio clip for your presentation. Once you've used CD Cabin's file manager to find the right file, simply dust off that CD-ROM (if you can find it), insert it in the drive, and double-click on its name.

CD Cabin can either use its built-in viewer to let you see the file's contents, or launch the application associated with the file. The viewer supports a breathtaking assortment of text, animation, picture, and sound file formats, including AVI, BMP, GIF, JPEG, PCX, and TIFF, to name a few.

I like CD Cabin—it's simple and clean. However, graphics professionals may prefer other products for image management. For instance, Inset Systems' HiJaak Graphics Suite stores thumbnail images of graphics files, making life easier for clip art collectors.

—Joe Abernathy ▶



MANAGE MEGABYTE MADNESS with CD Cabin, a Windows utility that creates a directory of your CD-ROM files on the PC's hard disk.

CD Cabin for Windows

Inexpensive file manager for your CD-ROMs.

The Aldridge Company

713/953-1940

List price: $99.95

Reader service no. 822

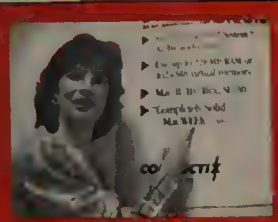
What Would You Call A $100 Digital Camera?

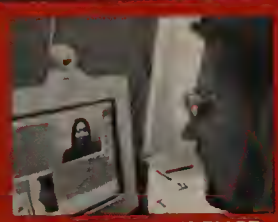
Video Magic.

QuickCam™ includes all you need to make movies and take pictures with your PC. Plug one cable into your parallel port, install the software and shoot. It's simple. Make training films, video conference, inventory valuables. It's easy to take pictures, too. Add photos to newsletters, documents, reports. QuickCam comes with Movie AVI for Windows, QuickMovie software, QuickFrame templates and QuickPicture image saver. All for around $100. Your satisfaction is guaranteed. Buy your QuickCam today wherever fine computer products are sold.

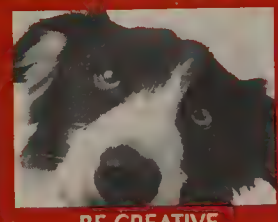
Connectix

System Requirements: A PC equipped with a 386, 486, Pentium or equivalent processor • Windows 3.1 or 3.11, Windows for Workgroups 3.1 or 3.11 • 4 MB RAM required


MAKE MOVIES


VIDEO CONFERENCE

TAKE PICTURES


BE CREATIVE

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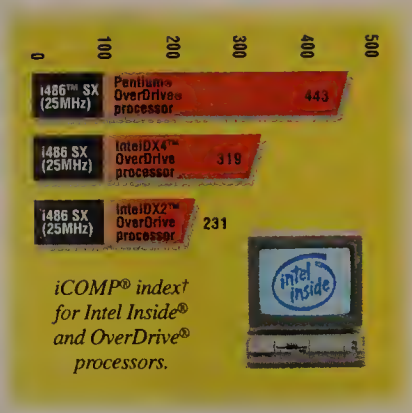
Circle 29 on reader service card

© 1995 Intel Corporation. †Source: iCOMP®: A Simplified Measure Of Relative Microprocessor Performance. Intel Corporation, 1992.††The 63-MHz Pentium OverDrive processor for most 50-MHz and 25-MHz Intel486™ CPU-based systems is available n
The 83-MHz Pentium OverDrive processor for most 66-MHz and 33-MHz Intel486 CPU-based systems will be available later in the year. *Other trade names referenced are the property of their respective holders.

Run your PC faster with the Ove

The OverDrive® processor is a single-chip CPU upgrade that maximizes the performance of most Intel486™ processor-based PCs.



iCOMP® index† for Intel Inside® and OverDrive® processors.

OverDrive processors boost CPU performance as much as 343%, making your software run much faster.

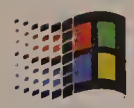
The family of IntelDX2,™ IntelDX4,™ and newly released Pentium® OverDrive processors†† gives you several affordable upgrade options for your i486™ CPU-based PC—each of them fully software compatible.

Contact your PC reseller for more information about OverDrive processors, or dial the FaxBack service at 1-800-525-3019, document #9306. Or call 1-800-538-3373, ext. 295.*

Drive® processor upgrade.

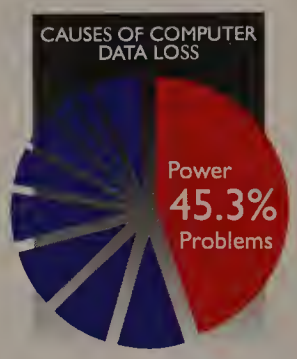
intel®

New Back-UPS®: $119 blackouts, brownouts

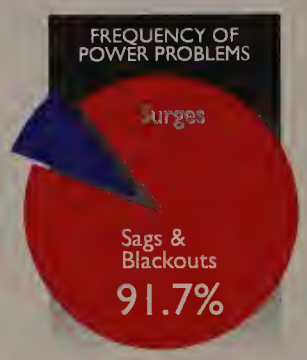


Just don't have the time for power problems on your PC? Don't worry. They'll always make the time for you. It's not if a power problem will occur, but when. Due to household appliances, poor wiring, bad weather or even other office equipment, power problems are as inevitable as death and taxes. You can't run, but you can hide, behind APC protection.

That's why we've just introduced new models in our award-winning Back-UPS line, now delivering reliable protection for just $119.



Source: Contingency Planning



Source: Bell Laboratories

In the next three months, more than 30,000,000 PCs will be hit by power problems...

Who needs power protection? If you use a computer, you do. A study in a recent *PCWeek* showed that the largest single cause of data loss is bad power, accounting for almost as much data loss as all other causes combined. Every PC plugged into an outlet is vulnerable. In fact, you have better odds of winning the lottery than of escaping the sting of power problems. One study found a typical PC is hit over 100 times a month, causing keyboard lockups, hard drive damage, and worse.

Simply put, if power problems are the least of your troubles, you've got one chance to keep it that way. You insure your car and home with the best policy you can afford. It just doesn't make sense to leave your PC (which is at far greater statistical risk) vulnerable to loss or damage.

Why a $119 APC UPS costs less than a $9.99 "surge protector"...

Contrary to most people's belief, a PC alone already has more protection built into it than a low-end "surge suppressor," which is usually nothing more than a well-packaged extension cord. In other words, going without any protection is just as good as underspending on one of the most important PC decisions you'll make.

For extended brownout protection for advanced PC workstations call about APC's New Back-UPS Pro!

And since sags and blackouts represent more than 90% of power problems likely to hit your computer, even quality, high-performance surge suppressors are literally powerless to protect you from data loss.

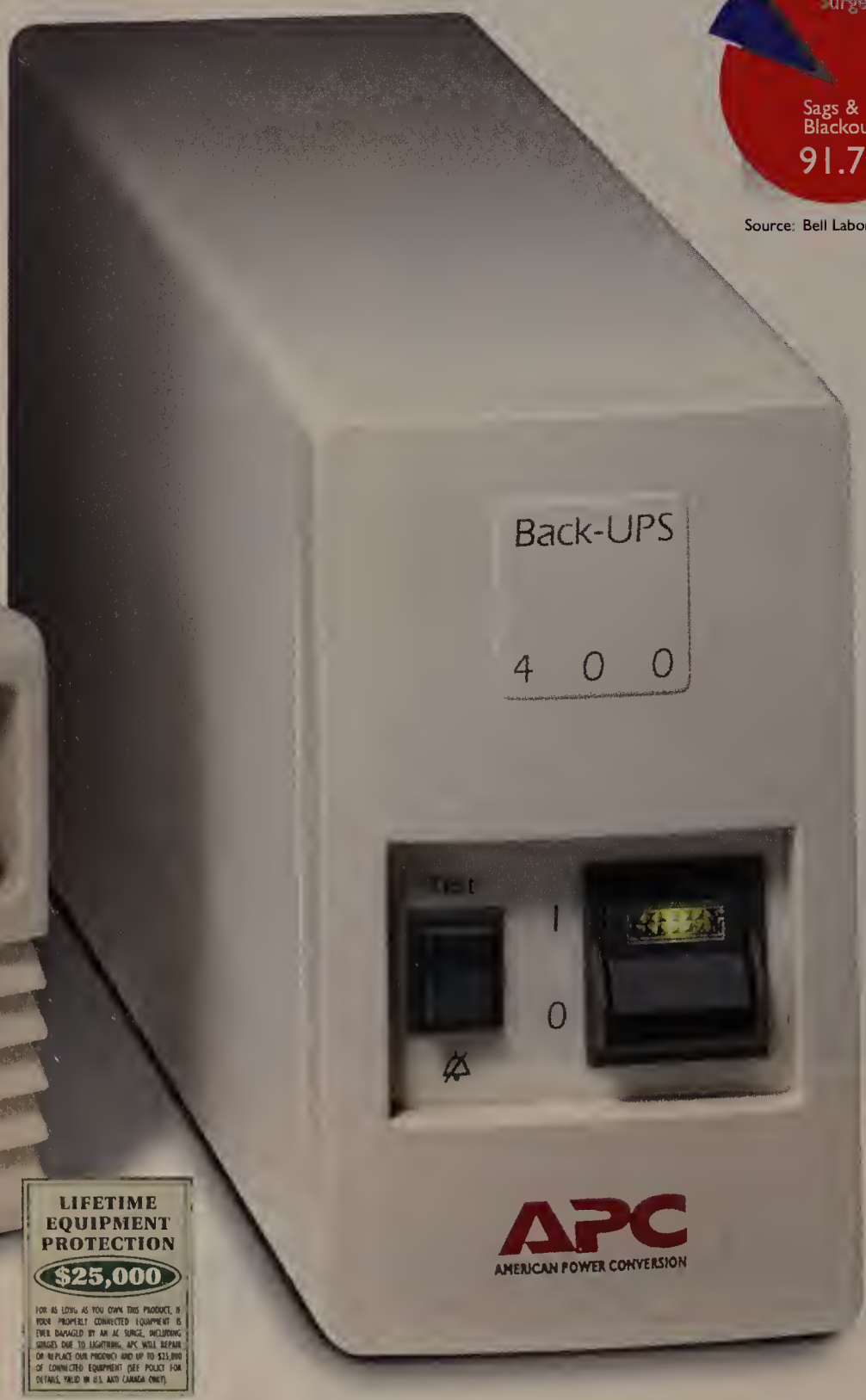
PC World Top 20 Upgrade

"Don't take chances. Get the ultimate protection... from APC." --PCWorld

"★★★★ *Back-UPS should be standard on every desktop... effective, affordable, designed to last..."* --PC Computing

"Never been cheaper or more convenient. A UPS can pay for itself the first time it saves your data." --MacUser

"The clear winner in price performance... it's unbeatable..." --PC Magazine UK



LIFETIME EQUIPMENT PROTECTION

$25,000

FOR AS LONG AS YOU OWN THIS PRODUCT, IF YOUR PROPERLY CONNECTED EQUIPMENT IS EVER DAMAGED BY AN AC SURGE, INCLUDING SURGES DUE TO LIGHTNING, APC WILL REPAIR OR REPLACE OUR PRODUCT AND UP TO $25,000 OF CONNECTED EQUIPMENT (SEE POLICY FOR DETAILS, VALID IN U.S. AND CANADA ONLY).

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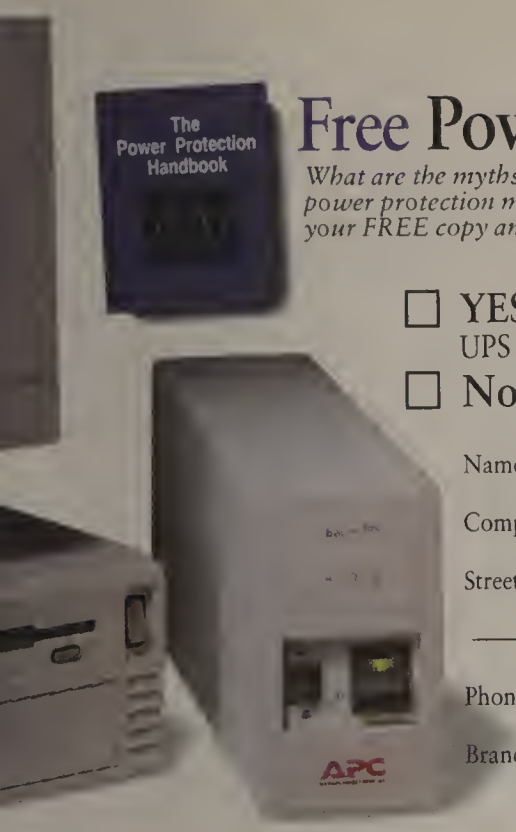

Free Power Solutions Handbook

What are the myths and musts of PC protection? What are the 10 most common power protection mistakes? The top tips for adding reliability to your LAN? Get your FREE copy and find out!

☐ **YES!** I'm interested in trading up a competitive or older UPS to a Back-UPS. Please send Trade-UPS info.

☐ **No!** But I would like a FREE Handbook.

Name _____ Title: _____

Company _____

Street/City/State _____

_____

Phone/fax: _____

Brands of UPS used? _____ # servers/PCs to be protected? _____

Name _____

Company _____

Address _____

City _____

State _____ Zip _____

Phone _____

P3

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West Kingston, RI 02892-9920

protection against and other trials by fire

More than 3,000,000 satisfied customers count on APC reliability that goes above and beyond the call of duty

After a raging fire which took 18 trucks to subdue, Michael Benolkin, director of the Systems Division at Correa Enterprises, Inc. didn't expect much. "While rummaging through the ashes, we heard something beeping. Our four APC units were still in action, while two UPSes from another brand were history. We're still using these same APC units at our new office location - they still work like a charm! We're impressed with the ruggedness, reliability, and product support offered by APC."

Trial by Fire

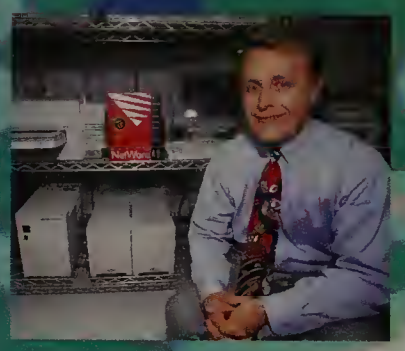
Brian Krause, Network Manager for Goodyear Airship Operations, knows how critical APC protection can be." The night of the All-star game a tornado came through our blimp hanger and took out our roof. Our airships demand absolute communication so I protect our local and remote servers with the most reliable protection I can find: APC. APC's PowerChute software shut our server down in an orderly way... closed out all files nice and neatly. When we reconnected, everything came back up perfectly, without a hitch."

Trial by Air

Doug Welch learns his reliability lessons well: "While still a Computer Science student, I was at home preparing a large spreadsheet for a final project when Anchorage experienced an all too common 5+ Richter earthquake. If not for my Back-UPS 400 it would have been back to square one! I'm now the Network Systems Manager at Charter College, in charge of three networks. I learned my UPS lesson well back in my student days. I've never been disappointed with APC and the product has had quite a work out."

Trial by Earth

Faced with a water main break, Mark Conley, Regional Manager of Novell's remote sales office in Detroit was amazed at APC's reliability. "The APC unit was sitting in an inch and a half of water, working just fine, as though nothing was unusual and we lost no data to this disaster. We've used APC here now for at least four years - more than a dozen units are all around the office, and we're well satisfied, so we were even more impressed to learn that the units are amphibious!"



Trial by Water

Back-UPS Award Winning FEATURES

- Unmatched surge/lightning protection for maximum hardware safety
- Site diagnostics automatically spot missing ground and reversed polarity
- LAN signaling allows simple shutdown with interface kits for automatic data protection (400 and above)
- User replaceable, hot swappable batteries insure uptime safe disposal. Batteries will last 3-5 years under normal use.
- $25,000 lifetime Equipment Protection
- 10 minute runtime with specified applications. For longer runtimes choose next largest unit.

Model	Application	Sugg.List
200 **NEW**	"Green" PCs	$119
280 **NEW**	LAN Nodes	$139
400	Desktop 486/386 systems	$199
450	Tower 486/386 systems	$254
600	CAD/CAM workstations	$359
900	Longer runtime	$529
1250	Multiple systems	$689

That's why you need instantaneous battery backup power from an APC Uninterruptible Power Supply to prevent keyboard lockups, data loss, and crashes. With an APC UPS, you get six times the protection of a high-end surge protector for little more than twice the price. And $119 is much less expensive than false piece of mind. APC UPSs carry up to a $25,000 lifetime guarantee against surge damage to your properly connected equipment, and are available to suit any application, from network servers and PCs, to fax and satellite systems.

PROTECT YOURSELF OR KICK YOURSELF...

It's been said that there are two types of computer users: those who have lost data, and those who are about to. Prevent the single largest cause of computer problems and join a fast-growing third category: those who protect their PC's with the most reliable protection they can buy: APC UPSes. So ask for APC at your favorite reseller. At just $119 an APC UPS is serious protection no serious computer user should be without.

APC has won more awards for reliability than all other UPS vendors combined...

LAN TIMES READERS CHOICE 1994 · Reseller News Editors Choice · VISION AWARDS BEST NEW PRODUCTS 1993 ResellerNews · Windows Mag Readers Choice

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P3

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Material World—A Global Family Portrait

Ever wonder what life is like in Bhutan? How about Iceland or Albania? Material World offers a unique view of world cultures through photos, videos, and slide shows of families in 30 countries. The disc covers the gamut of social classes: As you learn about the decidedly poor Natomos in Mali, the working-class Skeens in the United States, and the wealthy Abdullas in Kuwait, the differences among their cultures become strikingly clear. You'll learn how cushy life is in the United States compared to the harsh living conditions in other parts of the world. And you'll also get to see the possessions each family holds dear.

MINISTORAGE, ANYONE? The Pfitzners of Germany display their vast collection of household possessions.

Charles Kuralt's narration brings Material World to life, and the photographers' fascinating notes on their experiences with each family help personalize the photo collections. In addition, you can read questionnaires completed by the families that reveal much about their lifestyles, incomes, values, and aspirations.

Unfortunately, the blurry videos and poorly presented demographic statistics mar this otherwise enjoyable and educational CD-ROM. Still, shortcomings aside, Material World is well worth its $49.95 price for anyone—kids and adults—seeking a better understanding of people around the globe.

—Anita Hamilton

Material World

MULTIMEDIA **A worldwide tour of family life.**
Starpress Multimedia
800/782-7944
List price: $49.95
Reader service no. 697

Say, isn't it about time you did some weeding inside that hard drive of yours?

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Finance 101 for New–and Expectant–Parents

Who says kids don't come with an instruction manual? They do now—at least when it comes to figuring out all the child-related expenses you'll have to plan for before little Janie turns 18, gets into Stanford, and starts racking up the really big bills.

From estimating the annual cost of food, clothing, and diapers to detailed analyses of child care, Intuit's The Parents' Guide to Money answers many of the questions that keep parents awake at night.

The Parents' Guide walks you through a series of financial and personal questions. In the section on day care, for example, it not only details the costs of various options, but also discusses the trade-offs between, say, in-home care and a more structured, day-care center environment.

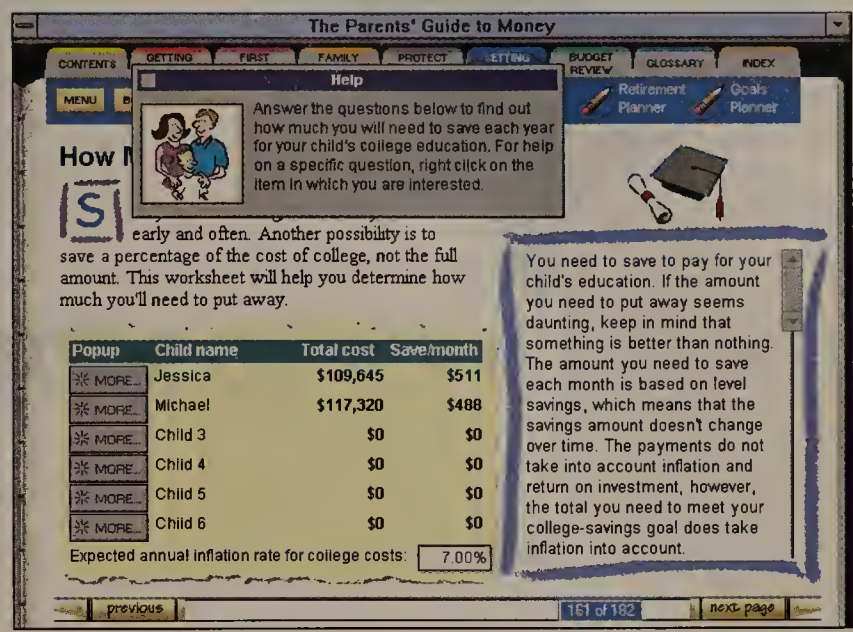
You'll need to enter some financial information because you can't import Quicken files. Fortunately, data entry is minimal; after you enter your financial profile in the first chapter, the program uses the same personal data in subsequent sections on child care, health insurance, and so on.

The Parents' Guide to Money is packed with information, all presented in an easy-to-understand format.

—Roberta Furger ▶

The Parents' Guide to Money

Helpful financial primer for marrieds with children.
Intuit
800/816-8025
Street price: $30



SENDING THE KIDS TO COLLEGE? Intuit's The Parents' Guide to Money offers wise fiscal advice to help parents plan for the future.

At last, a simple utility you can truly trust to clean things up. UnInstaller™ 3 is the newest version of 1994's No. 1 selling Windows® application.

Uncover loads of unwanted files. Save megabytes of disk space — *and headaches.*

What's more, you can move, archive, and transport any application with UnInstaller 3.

Available at your nearest software retailer. For help, call 1-800-775-8645.

The *Safest* way to clean Windows. Guaranteed.

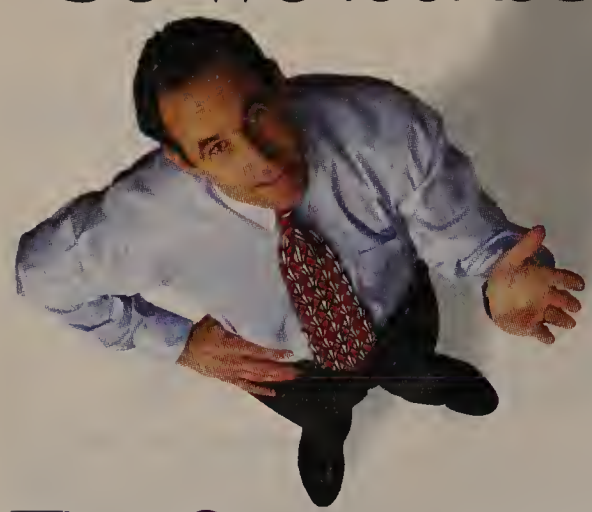
UNINSTALLER

REMEMBER, IT'S A JUNGLE IN THERE.™

MicroHelp

Circle 161 on reader service card

"**So** we looked for groupware that could bring



The first one was **supposed** to be user friendly.

The next promised compatibility.

been okay. If we had lots of **time** to waste

group, isn't there something that can turn us

us all together.

Not exactly.

They lied. *One would have*

All it takes is TeamWare™ Office: the complete suite of productivity applications that turns any group into a team, fast.

TeamWare Office includes e-mail, info sharing, document library, work flow, and a team scheduler, all fully integrated. It supports the Windows™ applications you're probably already

using. And it's ready to run the first day—no matter which major client/server system you have.

Call for your Free
demo & evaluation pack.*
1.800.20.TWARE.

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World Wide Web Homepage: http://www.tmware.us.com/tmware

Come on, we've got a good

into a **team**?"

There is simply no other product like it. TeamWare Office. Less work, more teamwork.

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Timbuktu Pro for Networks: Like Being There

You're on a business trip in New York. It's 8 a.m., and one hour from now you'll be giving a presentation from your laptop to some prospective clients. But you've just had a bone-chilling realization: The updated database files you need are right where you left them—on the departmental network server in your office, 3000 miles away.

This scenario doesn't have to end at the unemployment line. Thanks to Farallon's Timbuktu Pro for Networks, you can connect to your office LAN and drag and drop the database files from the remote server to your hard drive. You can also transfer large database files, although the software's performance is noticeably slow in remote mode.

According to Farallon, Timbuktu Pro is the first application to integrate remote node capabilities—via Shiva's Point-to-Point Protocol client software—with networked remote control for both Windows and Macintosh systems. Shiva's PPP is designed to enable remote users to gain complete access to all applications, files, printers, and other resources on a LAN. It works with most standards-based remote access server hardware or software.

The program's networked remote control capabilities allow two-way, real-time collaboration between users on a TCP/IP or NetWare-compatible LAN or WAN. MIS administrators, for example, can use their computers to take control of another user's computer for troubleshooting, installing software, or on-the-spot training, regardless of where the user is located. Windows and Macintosh users can also work together on the same document remotely.

Because Timbuktu Pro supports most video cards, you can view another computer screen on your display—even if the remote display is larger and has a higher resolution than your monitor.

While Timbuktu Pro makes it easy to take control of another user's computer, even basic operations, such as launching or opening a file, are noticeably—but not painfully—slow in remote mode. The program works in the background and doesn't modify system files or replace video, keyboard, or mouse drivers; as a result, one computer doesn't have to be identical to another in order for you to control it remotely.

If you're concerned about security, Timbuktu Pro's Set Up options let you prevent others from using your computer. You can assign access privileges to specific users, and you must assign individual passwords to remote users. Just don't lock out your boss too often, or you might end up in that unemployment line after all.

—James A. Martin

Timbuktu Pro for Networks 1.0

Combines remote control and network node features.
Farallon Computing, Inc.
510/814-5000
Street price: $139 for 2 users, $4000 for 100 users
Reader service no. 757

STAYING IN TOUCH: Timbuktu Pro for Networks lets remote users drag and drop files from the office server to their local hard drives.

Fastest Wireless LAN

The knock against wireless LANs is that they're too slow and expensive to replace conventional wired networks. Although this assessment is accurate, wireless LANs are improving steadily. Case in point: RadioLAN's new RadioLAN/10 is a wireless networking product that promises the 10-megabits-per-second performance of wired ethernet LANs.

The RadioLAN/10 Access Unit is an external device that fits a radio transceiver into a unit that's slightly smaller than a desktop computer speaker. It connects to the parallel port or uses an ISA or PC Card (formerly PCMCIA) add-in board to interface with the PC. Each RadioLAN/10 unit has a transmission range of 150 to 400 feet, depending on the number of walls and other obstacles. The product uses a new high-performance radio technology called 10BaseRadio that transmits data up to five times faster than competing wireless technologies, the company claims. The parallel port version of the RadioLAN/10 is priced at $425; the ISA and PC Card versions cost $350.

While the RadioLAN/10 is significantly more expensive than wired networking products, it may be convenient for use in hard-to-wire buildings, or as a temporary LAN.

—Jeff Bertolucci

RadioLAN/10

Wireless LAN promises wired network speeds.
RadioLAN, Inc.
408/526-9170, 800/930-4777
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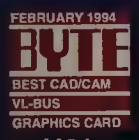

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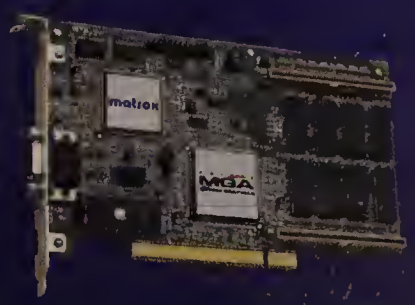

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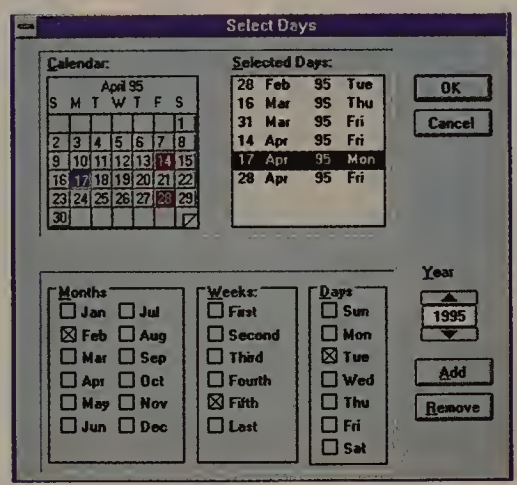
Circle 123 on reader service card

TimeVision: Life in the Scheduling Zone

As anyone who has worked with a group scheduling package knows, setting up meetings through old-fashioned phone tag can be a big exercise in futility. First introduced in 1989, TimeVision Network Scheduler has saved the sanity of an estimated 1 million users. The latest version is designed to make life easier for mobile computer users who must schedule meetings while they're on the road.



IN THE OFFICE OR ON THE ROAD, setting up multiple or recurring appointments is easy with TimeVision's scheduler.

Say you're flying from San Francisco to Atlanta, and you want to schedule a meeting when you reach your destination. Before departing, you copy your TimeVision workgroup schedule to the hard drive on the notebook. When you arrive in Atlanta, you then connect to your company's network via modem, and TimeVision's New Event Queue/Inbox feature synchronizes your calendar with those of other workgroup members.

The scheduling program is smart enough to adjust to time zone differences; it knows, for instance, that 11:30 a.m. in New York means 8:30 a.m. in Los Angeles. TimeVision's personal calendar also comes with a to-do list that lets you set alarms alerting you to important events.

Since group scheduling applications require some babysitting by a network administrator, TimeVision has been redesigned to make life easier for busy technical personnel. For example, mini-icons are tagged to user names, so an administrator can distinguish between types of users (such as local or remote) and resources (everything from conference rooms and audiovisual equipment to company cars and notebooks).

TimeVision's pricing ranges from a $195 single-user package to $495 (5 users), $895 (10 users), and $1995 (25 users).

—Bronwyn Fryer ▶

TimeVision Network Scheduler

Schedules meetings across a LAN or WAN.
CE Software, Inc.
800/523-7638
List price: $195 to $1995
Reader service no. 759

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Circle 206 on reader service card

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Here's something you may not know . . . certain monitors may be harmful to your health. When facing some monitors hour after hour, you may be exposing yourself, your family or your employees to unhealthful emissions. With that in mind, ViewSonic has adopted TCO, the **strictest** Swedish standard, for many of our new monitors, including our new ViewSonic 17GS. This standard is more stringent than the older MPR-II or Energy Star™ guidelines. The unique benefits of TCO certification include substantial reductions in heat emissions, power consumption and decreased exposure to electromagnetic fields.

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To offer attractive pricing for their systems, many computer companies integrate lower quality monitors providing less emission protection. You have a choice. Demand the quality, performance and **safety** available from ViewSonic now!

PC and MAC compatible

Product	ViewSonic 17GS	ViewSonic 17GA	ViewSonic 17PS
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Dot Pitch	0.27mm	0.27mm	0.25mm
Plug & Play +	YES	YES	YES
TCO Certified	YES	YES	YES
Max Resolution	1,280 x 1,024	1,280 x 1,024	1,600 x 1,280
Built in Speakers		YES	

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Circle 224 on reader service card

Synchronize Files Between Your Desktop and Notebook

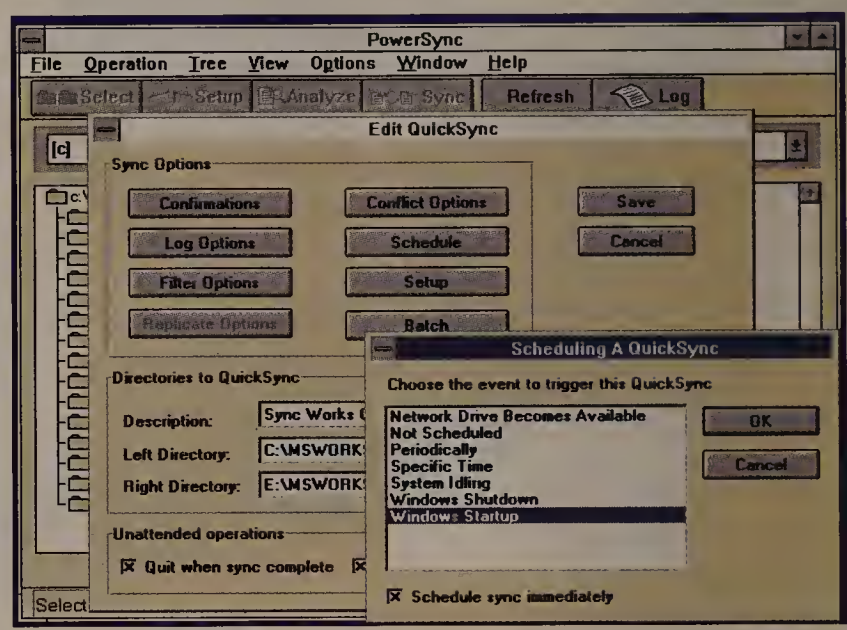
If you use a notebook and a desktop PC to work on the same data, keeping your files updated can be a real pain in the port. But the new version of PowerSync diminishes the drudgery of synchronizing files between two PCs.

Like the previous version, the $89.95 PowerSync 2.0 installs on only one machine and uses DOS 6.*x*'s Interlink utility to transfer files between connected systems. But version 2.0 offers an improved interface and more tools to make file management even easier.

For instance, the program's QuickSync utility lets you create "sessions" that synchronize specific directories at regular intervals. Just pick the directories on each drive that you want to sync, then save your settings. PowerSync's scheduler lets you choose how often you perform routine updates, such as weekly, hourly, or even every 5 minutes. I particularly like launching a QuickSync update whenever I connect my notebook to the desktop.

While PowerSync 2.0 works across a LAN or modem connection, it can also sync drives on the same PC. My only disappointment with this utility is that cables are not included; but Linkpro sells a bidirectional parallel cable for $10.

—Joe Peschel ▶



POWERSYNC 2.0's IMPROVED INTERFACE helps you synchronize files between two PCs across a LAN or modem connection.

PowerSync 2.0

Synchronizes files between two PCs.
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Reader service no. 760

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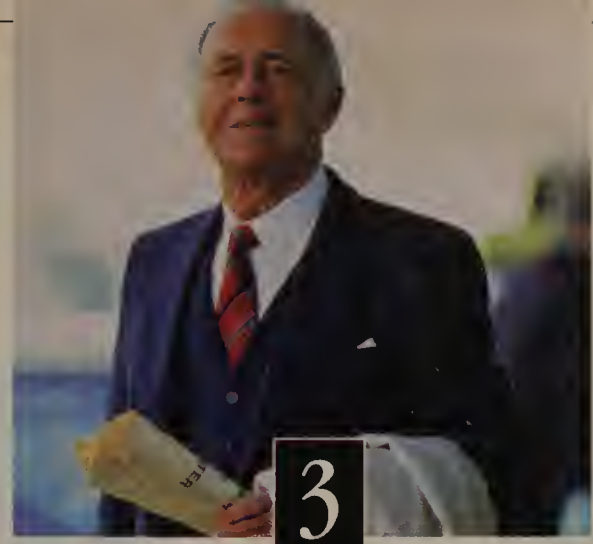

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This finger checks the system memory.

This finger inventories monitors.

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Check computer.
Walk. Walk. Walk.
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To make life a lot more efficient and a lot less aerobic, we've designed a network ready PC you can manage, monitor and even inventory from a single location, single-handedly. (Did you get all that?) Reintroducing the Compaq Deskpro.®

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For a more in-depth look at what the Deskpro is capable of, just call your local Compaq reseller. And feel free to put your feet up while you do it.

This finger is a thumb. It's only good for the space bar.

COMPAQ

Circle 61 on reader service card

CD940 Portable CD-ROM Drive

Weighing less than 3 pounds, EXP Computers' $449 CD940 portable CD-ROM drive certainly is easy to carry. But its claim to fame is that it operates without a power cord or batteries. Instead, the CD940 draws power from a notebook PC via a supplied PC Card (formerly PCMCIA) Type I connector and cable. With a 9¼-by-5¾-inch footprint, the CD940 is a truly portable multimedia solution for most notebooks not yet equipped with CD-ROM drives. And since the CD940 requires very little power to run, it won't eat up much of your notebook's battery life. When not in use, the CD940 automatically switches into an idle mode that uses no power. EXP Computers, Inc., 800/397-6922, 714/453-1020.

Reader service no. 738

InfoRecall Pro 5.0

InfoRecall Pro 5.0 is ideal for users who want a contact manager but who hate navigating fancy graphical screens. This no-frills program lets you input contact information or random notes in a pop-up box and allows you to input records as short as a few words and as long as 32,000 characters. InfoRecall Pro provides advanced search capabilities: You can search by keyword, phrase, or date, or by using AND/OR and IF NOT statements. In addition, the program's hypertext features enable you to link documents, such as contracts and reports, to a contact record. InfoRecall Pro also includes improved import/export capabilities for records, as well as cosmetic improvements such as new pop-up menus. The list price is $199.95. Phantech Software, 800/203-1311.

Reader service no. 739

Pivot 1700

Here's a 17-inch monitor with a twist: The $895 Pivot 1700 can be rotated 90 degrees to display your documents in either landscape or portrait orientation. With Energy Star and MPR-II compliance, digital controls, a sharp .26mm dot pitch, and a maximum noninterlaced resolution of 1280 by 1024 at 60 Hz, the Pivot comes with all the features you'd expect in a high-end monitor. If you do a lot of desktop publishing, you'll probably prefer the vertically oriented portrait mode, which uses the screen's area more efficiently than does conventional landscape mode. Best of all, you can pivot while you work—there's no need to close apps before rotating the screen. Portrait Display Labs, 800/858-7744, 510/227-2700.

Reader service no. 740

Off-Line Xpress 1.0 for Windows

Mustang Software, maker of the popular Qmodem communications and Wildcat bulletin board system programs, has a new tool for BBS enthusiasts. Off-Line Xpress (OLX) 1.0 for Windows is an inexpensive mail reader that lets BBS users read and reply to E-mail messages offline, thereby reducing telephone charges. OLX is compatible with the QWK E-mail standard for BBSs and works with any general-purpose communications program, including Procomm Plus and HyperAccess. OLX's editor lets you write up to 16,000 lines of text per E-mail message, and its spelling checker has a dictionary of 124,000 words. It's priced at $49. Mustang Software, 800/999-9619, 805/873-2500.

Reader service no. 741

CD-ROM DRIVE USES NOTEBOOK POWER: EXP Computers' CD940 Portable draws its power via the supplied PC Card.

NovaPak 144

Notebook PC users on the road want to carry as few add-ons as possible. So Novalink Technologies' new NovaPak 144 packs a 14.4-kbps cellular-ready fax-modem—with both voice and alphanumeric paging capabilities—on a single PC Card (formerly PCMCIA) Type II card. You can use the $449 NovaPak 144 as a standalone alphanumeric pager because it has a tiny LCD window similar to those found on most pocket pagers. The NovaPak's communications software automatically distinguishes between incoming data, fax, and voice calls and lets you set up multiple voice-mail boxes. When you insert the NovaPak into a PC Card slot, it automatically transfers paging messages (stored in the card's RAM) to the PC's hard drive. Novalink Technologies, Inc., 800/668-2546.

Reader service no. 742

GoldSync

Elan Software now offers a data synchronization sidekick, GoldSync, for its popular GoldMine contact management software. GoldSync lets multiple GoldMine users synchronize their data automatically at scheduled intervals via modem. With GoldSync, GoldMine users can be sure they have the most up-to-date notes, schedules, and contact information. The bidirectional synchronization can be initiated by either the LAN server or the remote user. The $495 GoldSync server software supports up to 100 simultaneous incoming and outgoing connections. The client software lists for $99 per user. Elan Software, 800/654-3526, 310/454-6800.

Reader service no. 743

LitePro 580, LitePro 760

In Focus Systems has two new LCD projector panels that redefine the high end in different

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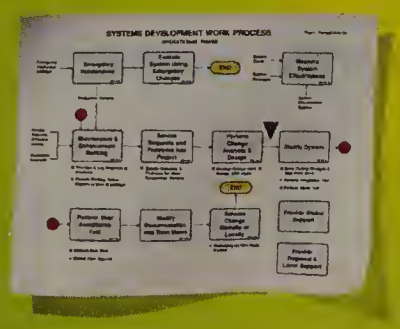
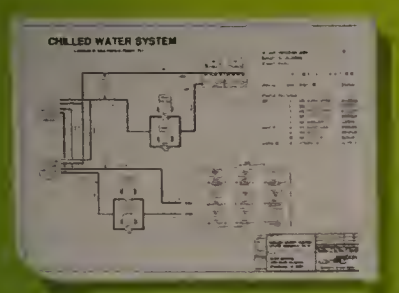
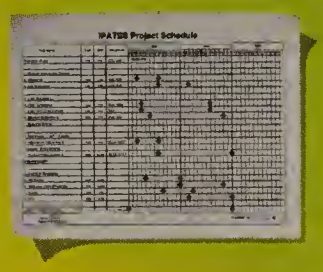
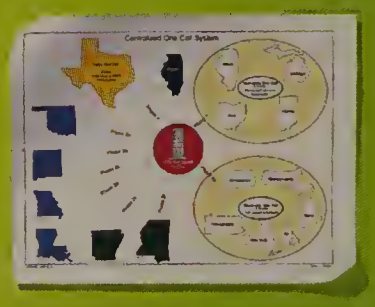


JOHNSON CONTROLS "Visio makes it possible to move from a complex world of CAD to a much simpler world of Windows desktop drawing tools. We went from 4000 CAD symbols in AutoCAD® down to 200 Visio SmartShapes®—this simplicity is driving a great deal of value. We've reduced our engineering cost significantly." *Bill Huth (Manager Field Design Engineering)*





MOBIL "I recommend Visio to anybody who needs to express ideas or get decisions made in a short period of time. One Visio drawing tells the story that 100 pages of text do not." *Wayne Kendrick (System Analyst)*



CHRYSLER "At Chrysler, Visio lets us annotate and view CAD drawings which formerly were annotated in an unfriendly fashion on a mainframe. Visio's modern interface makes using PC-based graphics easy for everyone." *Robert Levy (System Analyst)*

SMITH BARNEY "Never seen a product make people so productive, so quickly." *Doug MacLean (Senior LAN Administrator)*

Visio is a mere $129. To order, call (800) 457-3335, ext. F27. For information on Organization Licensing programs or to qualify for a Visio Evaluators Kit call 206-521-4500.

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Business drawing for people whose business isn't drawing.™

ways. The $9999 LitePro 580 is the first projector panel to use a polysilicon LCD, which in theory should produce brighter images and purer colors than the more common TFT designs. The 580 is capable of displaying 16.8 million colors—more than most notebooks support—though it reaches only 640 by 480 resolution. The $7999 LitePro 760 is In Focus's new high-resolution projector panel: The company claims that the 760 is the first portable projector to support 1024 by 768 resolution, so you can put more information on the screen. The LitePro 760 uses a standard, nonpolysilicon LCD and supports a palette of 24,000 colors. In Focus Systems, 800/294-6400.

Reader service no. 744

Maximizer 3.0 for Windows

Sales professionals who need a powerful contact manager may want to check out Maximizer 3.0 for Windows. The new version delivers more ease-of-use features such as balloon help and a built-in word processor. Priced at $249, Maximizer costs more than many contact managers, but salespeople will appreciate the program's above-average customization options and its ability to keep an audit trail of contact activity (such as when you update a record after a sales call). Maximizer 3.0 adds OLE support for linking documents to client records and has more flexible scheduling and to-do list features (for example, it now shows holidays on its calendar and can schedule recurring appointments). Modatech Systems International, 800/804-6299.

Reader service no.745

UltraSound Ace

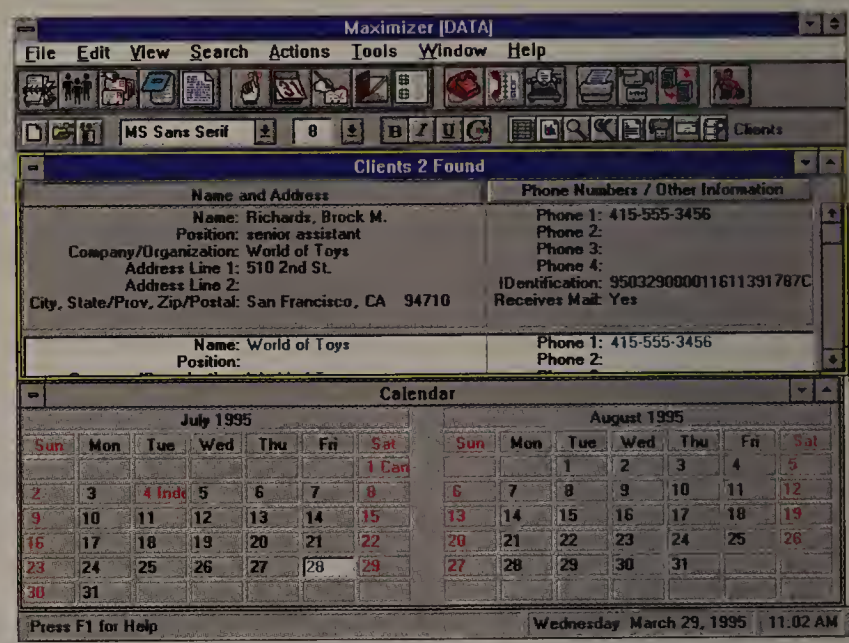
Sure, you've got a sound board. It's that cheapo model that shipped with the PC you bought at Costco. Unfortunately, it uses FM synthesis to mimic instruments, resulting in audio output that's about as close to "stereo quality" as your old transistor radio. Advanced Gravis's $99 UltraSound Ace is an ISA add-in board that brings high-fidelity wave-table audio to your PC. Designed to work with any Sound Blaster–compatible 8-bit or 16-bit sound card, the UltraSound Ace comes with an audio cable that connects to your existing sound card. Its 32-voice wave-table synthesis and 32 digital channels allow more realistic audio playback on your computer, according to the vendor. Advanced Gravis, 800/663-8558, 604/431-5020.

Reader service no. 746

Primax ColorMobile Office

This versatile, 400-dots-per-inch color hand scanner packs a big punch. Snap on the feeder module, and the compact Primax ColorMobile Office becomes a miniature sheetfed scanner. Add the motor module, and the scanner smoothly glides over documents and photos—eliminating the blurry, uneven images that sometimes result from hand-controlled scans. Bundled software includes a TWAIN driver, OCR software, a multimedia presentation package, and a multimedia file manager. The $329 ColorMobile Office plugs into a PC's parallel port. Primax Electronics, 800/774-6291, 408/364-2800.

Reader service no. 747



POWERFUL CONTACT MANAGER: Maximizer 3.0 for Windows has above-average customization features for sales professionals.

WinCIM 1.4

CompuServe's latest version of its popular Windows interface lets you display CompuServe hypertext documents that contain multiple fonts, colors, and graphical images—a vast improvement over the drab, text-based displays that ruled in CompuServe's past. And like users of the Internet's World Wide Web, WinCIM 1.4 users can jump to related topics on CompuServe by clicking "hot links" (usually highlighted text) within a document. According to CompuServe, hot link locations will include discussion forums, related documents, images, or service menus. In addition, WinCIM 1.4 allows you to launch other Windows programs to view, say, a specific document or image. WinCIM 1.4 is available free for members. CompuServe, 800/848-8199.

Reader service no. 748

Working Watermarker

If your Windows word processor doesn't offer a watermark creation tool (for making a background image rather than a true, paper-embedded watermark), check out Working Software's Working Watermarker. This helpful utility lets you add a monochrome graphic—such as a logo, label, or message—to any PC-based document you print. It provides an easy way to incorporate your company logo into documents, or to show messages like "Draft" or "Urgent" in large type behind the main text. The software comes with a collection of ready-to-use watermarks, or you can design your own with the Windows fonts on your PC. You can use bitmapped images for picture watermarks, and with the program's rotation and contrast tools you can fine-tune a watermark's appearance on the printed page. Working Watermarker lists for $49.95 but should cost under $40 on the street. Working Software Inc., 800/229-9675, 408/423-5696.

Reader service no. 749

For more information about any product, contact the manufacturer or circle the number on the reader service card.

LOTUS

GET THE MOST FROM THE LOTUS APPLICATION SUITE

Pick a Maintenance Plan

Once I bought a VW Bug for $1000 and spent three times that amount to keep it running for the next two years. That's not too surprising for an old car, but there's an odd analogy for new software. You can upgrade to 1-2-3 release 5.0 for Windows for less than $100, but an annual tech support contract costs twice that.

Okay, 1-2-3 isn't a, um, Buggy product, and Lotus doesn't make its profits on tech support. Very few of us buy that annual contract. We rely instead on other users or the alternatives outlined in "Get the Support You Need." And sometimes we hope that an upgrade (and the 90 days of free support that comes with it) will do the trick.

Keep us posted on your experiences with support—wherever and however you find it! Write me at 77 Franklin St., Boston, MA 02110; via fax (617/426-0235); or at ebender@aol.com.

Eric Bender

Eric Bender, Executive Editor

Our Favorite 1-2-3 Add-Ons

L6 We searched high and low to find templates and utilities that maximize your spreadsheet's potential. Here are 21 of the best products we found.

The Cheapskate's Guide to 1-2-3 Enhancements

L15 Check out the goodies offered by your friendly local user group and the major online services.

Get the Support You Need

L17 Once upon a time software was expensive and support was almost free, but today the situation is often reversed. This quick overview will help you choose the right technical support plan for your Lotus software.

Give Your PC a SmartSuite Tune-Up

L21 Any self-respecting Windows package can slow your PC down to a crawl—unless you're set up right. Follow these tips to add more zip to your SmartSuite applications.

News

L2 How Notes 4.0 will compare to Microsoft Exchange, and Lotus finally overhauls Ami Pro.

Fax-Back Survey
L5 Tell Lotus What You Think!

Improving Your Skills
L24 Add Style to Your Worksheets

1-2-3 Tips
L27 Pull Text Strings in the Worksheet

Q&A
L29 Specify Several Print Ranges at Once

Macros
L33 Control Macros With Your Own Menus ✱

Suite Success
L36 Make Notes Remotely Possible

COMING IN JULY
- A Tool Kit for 1-2-3 Utility Macros
- Get the Most From Organizer

✱ The models and other files from this article are available via PC World Online on America Online and CompuServe.

Microsoft Treads on Notes' Turf

Microsoft has left the groupware market to Lotus, and Lotus alone, since Notes first shipped in 1989. But later this year, that will begin to change when the software colossus releases Windows 95.

This next generation of Windows includes Exchange, a built-in E-mail client aimed at the heart of Notes and given free of charge to the millions of PC users who will be upgrading from Windows 3.1. Exchange will compete with Notes 4.0, the major upgrade that Lotus expects to ship later this year.

Actually, the Exchange mail client in Windows 95 is just one part of the new system that Microsoft hopes will push it into the groupware big leagues. Sometime after Windows 95 finally appears, Microsoft plans to ship its Exchange Server, a Windows NT–based product that will give the client most of its groupware features.

What do Notes and Exchange Server have in common? Both offer E-mail, electronic forms, shared discussion groups, and a set of tools to help end users create custom views of messages and data. And both programs can serve as a development platform for vendors to deliver group applications.

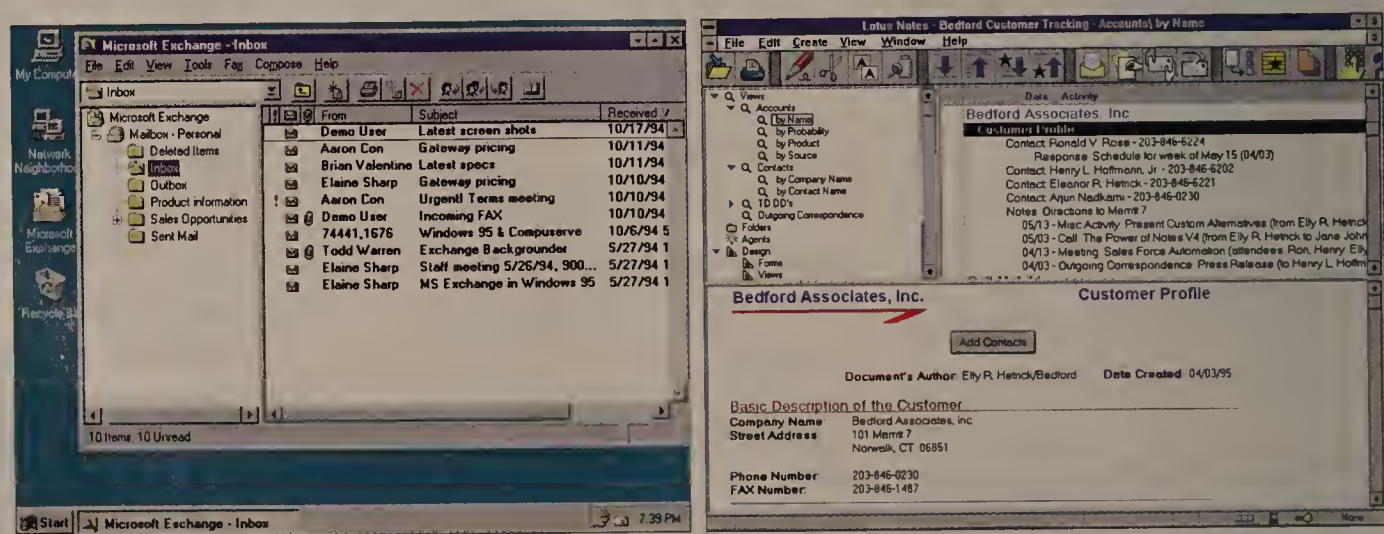
Both Microsoft and Lotus are also striving to provide the very interface that computer users live in, day in and day out. "In bundling Exchange with Windows 95, Microsoft is trying to make Exchange your home base, where you hang out and come back to," explains Cliff Conneighton, president of the Conneighton Group, a consulting firm in Hollis, New Hampshire. "It's exactly the same thing Lotus is trying to do."

NOTES' MATURE DESIGN WILL GIVE IT AN EDGE over newcomer Microsoft Exchange, says Joel Tepp of Kemper Securities.

Exchange and Notes will not look much like each other. The Exchange client bears a strong resemblance to Explorer—a Windows 95 tool that replaces Windows 3.1's Program Manager and File Manager.

"The Exchange client, when it starts, looks like another Explorer," says Greg Lobdell, group product manager for business systems division marketing at Microsoft. "There are two panes: The left side shows the Inbox hierarchy and folders, and whatever you click on there is shown in the right-hand view." By contrast, Notes 4.0's new interface uses a three-pane view that's strikingly similar to cc:Mail's approach.

When the Windows 95 Exchange client software hooks up with the Windows NT server, users are able to work with public folders and server-based rules. Public folders are shareable versions of basic Exchange informational folders that allow users to share not only mail messages, but



EXCHANGE'S TWO-PANE USER INTERFACE (left) closely resembles that of Windows 95's Explorer tool for program and file management. By contrast, Notes 4.0 (right) offers a three-pane view modeled after cc:Mail.

also documents, forms, scheduling information, and even phone messages. These folders can form the basis of groupware applications such as discussion databases and sales tracking programs.

Despite the groupware niceties, users may feel that Exchange is mostly just gussied-up E-mail. But Microsoft customers argue that there is absolutely nothing wrong with that strategy. For instance, the package will offer Inbox Assistant, a tool that uses sophisticated E-mail rules for filtering out junk messages and automatically rerouting or responding to messages. "There are some things Exchange does that Notes doesn't even try to do, like autochecking your Internet mailbox, CompuServe mailbox, and local Exchange mail at self-adjusted intervals," says David Greenberg, chief information officer for the Orlando Health Care Group, a health maintenance organization based in Florida.

But by the time the first version of Windows 95 ships, Notes will have undergone its fourth major release. For many users, that's key to Notes' appeal. "I don't want to develop around a core that might be changing," says Joel Tepp, vice president of investments at Kemper Securities in Seattle. "My inclination is to go with a known entity, where there is nothing wrong with the entity."

Furthermore, argues Tim Dempsey, director of Notes product marketing at Lotus, Notes' replication—its ability to automatically synchronize the databases used by multiple servers and remote users—gives it a major advantage over Exchange, especially for organizations that need to distribute full-blown applications to remote users. With Notes, says Dempsey, "applications are available whether you are connected or not." But with Exchange, "there is no bidirectional local replication, so remote users can only exchange mail."

Dempsey also points out that while Notes clients already run on Windows, OS/2, Macintosh, and UNIX platforms, the Exchange client software will at first be available only for Windows 95.

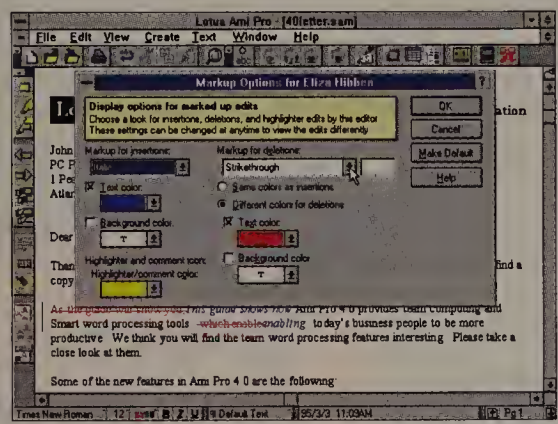
Notes 4.0's deep roots are apparent in features such as its software "agents," which can be built either by programmers or end users, and its Navigator interface, which can present data behind flowcharts, maps and other visual representations.

Overall, Notes and Exchange provide two distinct paths to productivity. "The end result in three to five years is the same: information everywhere," says Microsoft's Lobdell. "But how we get there is fundamentally different." **—Doug Barney**

Ami Pro Gets Team Features and a New Name

Ami Pro users have waited three long years for a significant upgrade to Lotus's word processor. The company is getting ready to reward their patience with a version that's been completely retooled—and rechristened Lotus Word Pro.

The package's most striking new features are its extensive tools for collaborative editing. Word Pro lets multiple workers route documents automatically, and it tracks all additions, deletions, changes, and annotations made by each user. The product also provides more-sophisticated SmartMaster templates, the InfoBox palette for instant formatting, more document views, an instant spelling checker, strong import and export capabilities for Microsoft Word and WordPerfect files, support for the LotusScript language and OLE 2.0 data exchange, and many other features.



AMI PRO HAS EVOLVED INTO WORD PRO, a team-oriented word processor.

The Windows 3.1 version of Word Pro is due out in July. A nearly identical Windows 95 release will appear in early fall, followed by an OS/2 version. **—Harry McCracken**

SmartSuite Upgraded for Windows 3.1—With or Without Notes

With Windows 95 delayed, Lotus has released two SmartSuite updates for Windows 3.1: SmartSuite 3.1 and NotesSuite: Desktop Edition 1.1.

The biggest addition to SmartSuite 3.1 is Organizer 2.0, an upgrade to Lotus's personal information manager that adds group scheduling, call logging, and additional views of calendar information. Other applications remain essentially unchanged, although 1-2-3 now offers an improved filter for importing Excel 5.0 worksheets.

SmartSuite 3.1 also introduces SmartCenter 2.0, a new version of the command center utility that lets you customize SmartCenter's icons, size, and location with an InfoBox (the all-in-one formatting tool that Lotus will add to all its applications).

NotesSuite: Desktop Edition 1.1 bundles SmartSuite 3.1 with Notes Desktop release 3.3, a new Notes client alternative.

Lotus plans another Windows 3.1 SmartSuite upgrade in July, which will add new versions of Word Pro (formerly Ami Pro—see above) and ScreenCam. After that, the company will monitor Windows 95's acceptance before planning any more SmartSuite releases for Windows 3.1. Lotus's main push will be for Windows 95.

SmartSuite 3.1 lists for $499; competitive upgrades from a wide variety of programs are available for $299. Users of SmartSuite 3.0 can upgrade for $30 by calling Lotus at 800/343-5414. NotesSuite: Desktop Edition's estimated retail price is $399 (in quantities of 50 or more). **—Eric Hellweg**

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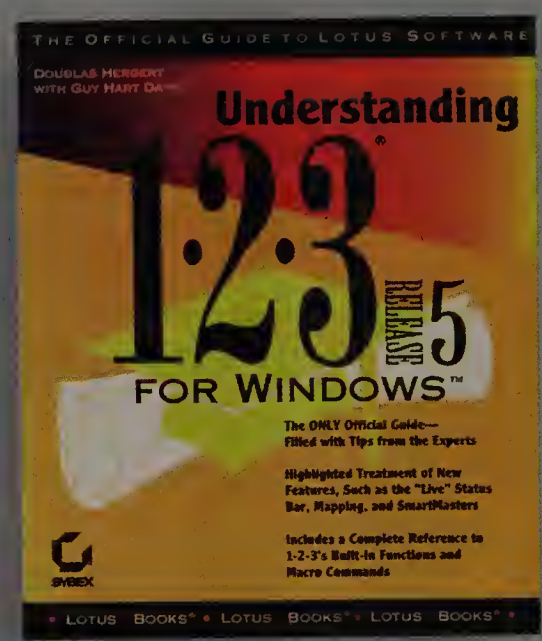

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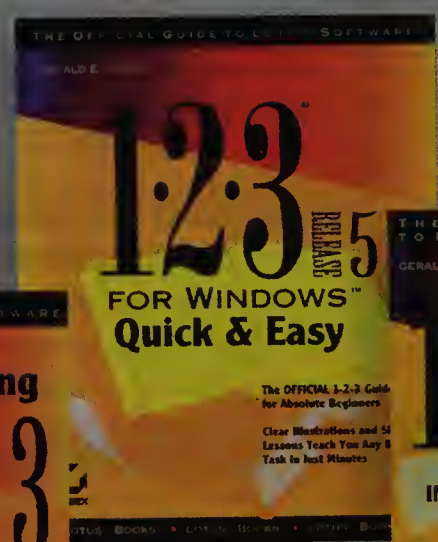

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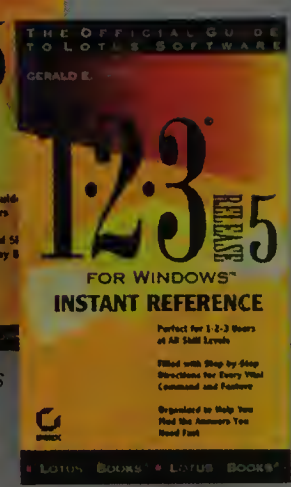

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Tell Lotus What You Think!

How do you feel about Lotus and its products? Here's your chance to applaud or upbraid the software giant—and offer some useful suggestions. Fill out the questionnaire below and we'll enter you in a drawing to win SmartSuite 3.1 for Windows. Five lucky winners will be chosen. All questionnaires must be received by June 30, 1995.

TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number in the boxes below. Then fill out the rest of the questionnaire.

TO ENTER: Fax the completed questionnaire to 617/521-8589. Do NOT fax a cover page. If you don't have a fax machine, mail your survey to Fax Survey, PC World Lotus Edition, 77 Franklin St. #300, Boston MA, 02111.

Name: Last, First

Phone Number

Please indicate the Lotus products you use and your satisfaction with each.

PRODUCT	LENGTH OF USE IN YEARS	HOW SATISFIED? (1, not at all, to 5, extremely)
❍ 1-2-3/Windows		
❍ 1-2-3/DOS 3.x or 4.0		
❍ 1-2-3/DOS 2.x		
❍ Ami Pro		
❍ Approach		
❍ cc:Mail		
❍ Freelance		
❍ Notes		
❍ Organizer		
❍ SmartSuite		

How do you get help when you use Lotus products?

❍ Lotus documentation ❍ Online help
❍ Lotus technical support ❍ Colleague
❍ In-house technical support ❍ Other
❍ Classroom training
❍ Third-party books

How satisfied are you with the documentation Lotus offers with its products?

❍ Extremely satisfied ❍ Not at all satisfied
❍ Satisfied ❍ Don't know/never use

How would you rate the value of Lotus products for the price?

❍ Very good ❍ Fair ❍ Very poor
❍ Good ❍ Poor

How well do you think Lotus is serving companies the size of yours?

❍ Extremely well ❍ Not very well
❍ Very well ❍ Not at all well
❍ Fairly well ❍ Don't know

How well do you think Lotus supports the products you use?

❍ Extremely well ❍ Not very well
❍ Very well ❍ Not at all well
❍ Fairly well

What improvements could Lotus make in product support?

How likely are you to recommend Lotus products to your coworkers and friends?

❍ Extremely likely ❍ Not very likely
❍ Very likely ❍ Not at all likely
❍ Somewhat likely

In comparison with other companies' software, how would you rate Lotus software?

❍ Cutting-edge ❍ Not very advanced
❍ Very advanced ❍ Lagging behind the competition
❍ Competitive

Which company would you rather do business with, Lotus or Microsoft?

❍ Lotus ❍ Microsoft

Taking into account everything you know about Lotus software and Lotus's business strategy, what is the company doing right?

What is Lotus doing wrong?

What other comments do you have about Lotus?

What is your job level?

❍ Executive ❍ Professional
❍ Senior management ❍ Self-employed
❍ Supervisor ❍ Retired
❍ Technical ❍ Other

How many people does your company employ?

❍ 1 ❍ 10–24 ❍ 50–99
❍ 2–9 ❍ 25–49 ❍ 100+

How many people at your location use Lotus products?

❍ Most ❍ About half ❍ A few ❍ Just me

PLEASE FAX TO 617/521-8589

LOTUS

OUR FAVORITE 1-2-3 Add-Ons

These 21 templates and utilities let you exploit your spreadsheet to the fullest.

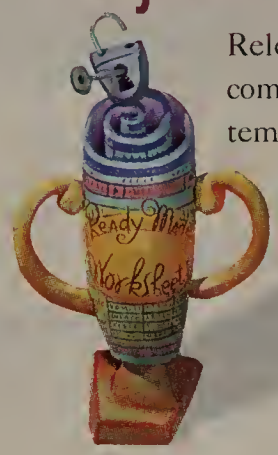
Okay, 1-2-3 is *perfect* for you. It offers every last function you could want in a spreadsheet, all implemented so well that only telepathy would be better. And you have *every worksheet* you could conceivably want—every sheet perfectly built, thoroughly self-contained, stocked with all the data you'd ever need, and completely debugged.

No? Then step right up and take a look at our favorite add-on templates and utilities for 1-2-3.

True, the spreadsheet aftermarket is not what it used to be—a teeming mass of entrepreneurs eager to provide the 1-2-3 public with ready-made solutions to common spreadsheet problems. These suppliers have dwindled to a stalwart few, as most of their innovations have been co-opted by 1-2-3 itself. What remains, however, is a flourishing crop of highly detailed worksheet templates and some old standards that handle problems that still stub 1-2-3's toe. Here are 21 of the best products for speeding your spreadsheet work—and maybe even making it enjoyable.

BUD PEEN

Save Time With Ready-Made Worksheets



Release 5.0 for Windows comes with 11 predesigned templates for common spreadsheet tasks. But these don't do you much good if you need a more specialized solution or if you're working in an earlier version. Fortunately, there's a variety of templates for all releases—if you're willing to pay between $59 and $400 for a ready-to-run application. (If not, check out "The Cheapskate's Guide to 1-2-3 Enhancements" in this issue.) The templates we looked at range from simple personal calendar worksheets to complex forecasting models.

1. Predict Your Financial Future

Do you sometimes wonder if you're putting enough into your 401(k) to live comfortably in your golden years?

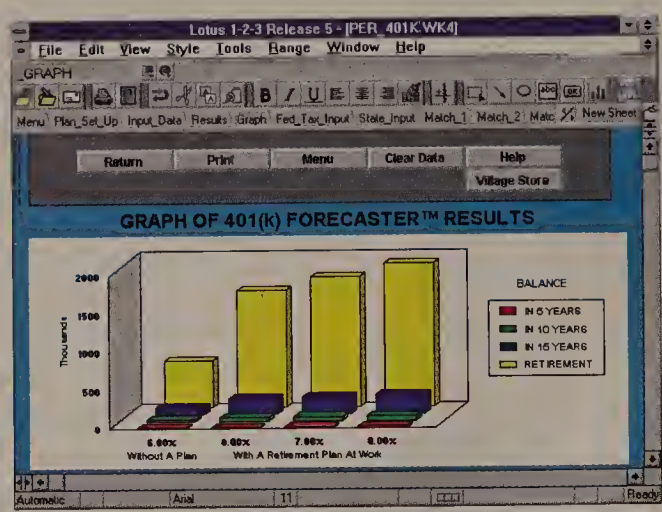
Wonder no more. 401(k) Forecaster is an in-depth 1-2-3 for Windows worksheet template that allows you to plan your 401(k) or 403(b) retirement accumulations.

401(k) Forecaster takes into account all the factors that affect your retirement savings: your current salary, contributions from you and your company, federal and state income tax rates, investment or interest rate projections, and retirement age. Once you've entered this data, you can review the results in a summary worksheet that includes an estimate of the amount of savings you can expect at retirement. You can also see the results in graphical form.

If you're a 1-2-3 user who's considering joining your company's 401(k) plan, or you just want to keep tabs on your retirement nest egg, 401(k) Forecaster is an essential financial planning tool. It works with 1-2-3 for Windows and is available from Village Software for $69. —*David Maguiness*

2. Get Organized With Personal Calendar

You've lost the memo that told you when your flight leaves next week, and you can't remember what time you were supposed to

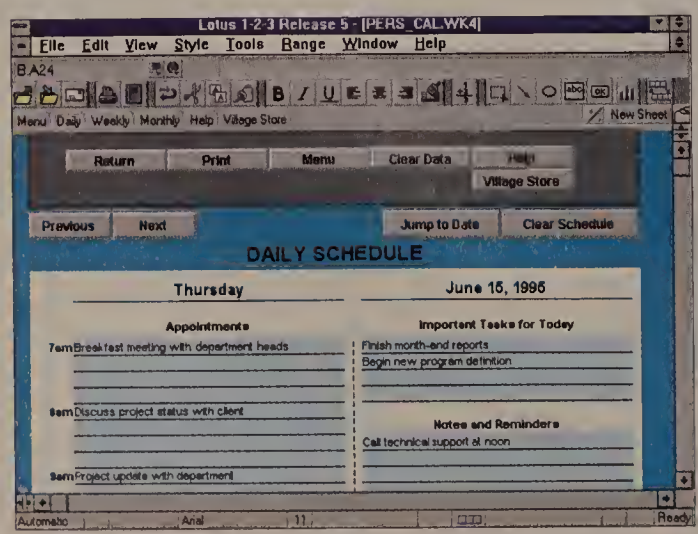


WATCH YOUR NEST EGG grow with 401(k) Forecaster.

meet with your son's algebra teacher. You need some organizational help but don't want to bother with a full-fledged personal information manager. Personal Calendar, a 1-2-3 for Windows macro-driven template, helps you organize and plan your daily, weekly, and monthly schedule, all without making you leave the comfort of 1-2-3.

When you open Personal Calendar, you're greeted by the main menu, which lets you edit, view, or print your calendars. You enter appointments, meetings, and other events in the Daily Schedule. Data entered in "Important Tasks for Today" appears in the Weekly Schedule, while check marks appear in the Monthly Schedule to let you know you have appointments on that day.

Personal Calendar isn't a full-featured PIM like Lotus Organizer. But if you don't need all the bells and whistles of a dedicated PIM and are already a 1-2-3 for Windows user, Personal Calendar may be what you need to get back on track. Personal Calendar is available from Village Software for $59. —*D. M.*



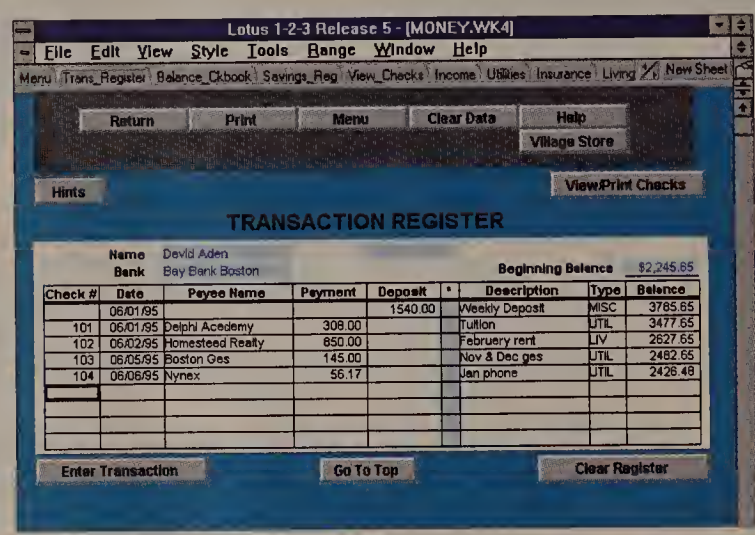
PLAN YOUR DAY IN 1-2-3 with Personal Calendar.

3. Take Control of Your Finances

Money Controller is for the 1-2-3 user who wants to get more control over personal finances, who needs some help doing it, and who probably won't bother if the program offered is too complicated or intimidating.

Money Controller provides fill-in-the-blank templates for recording all checking and savings account transactions. At the end of the month, Money Controller helps reconcile the entries with your bank statement. Separate templates are used to enter utility, credit card, entertainment, and living expenses.

The end product is, of course, a budget. Money Controller can compute it either by totaling the information entered in the income and expense templates (a comprehensive budget), or by totaling the data entered in the check register (a simple budget). The two budgets are then graphically compared via pie charts, showing users how their best-laid budget plans match up with harsh reality. The Money Controller requires 1-2-3 for Windows and is available from Village Software for $59. —*David Aden*



KEEP AN EYE ON YOUR FINANCES with Money Controller.

4. Compare the Options

Lease Versus Purchase FastAnswer lets you closely analyze the costs of up to five auto leases. You can also calculate lease versus purchase options for fixed assets. A macro-button menu makes the templates easy to navigate, and excellent graphics let you see at a glance the bottom line of car leasing. Lease Versus Purchase FastAnswer requires 1-2-3 for Windows and is available from Village Software for $69. —*Steve Adams*

5. Calculate Your Net Worth

Net Worth Builder helps record and track the value of your assets. You enter your stocks, bonds, savings, and other assets in a series of dialog boxes. Net Worth Builder summarizes the data on a financial statement that you can use to secure credit, or displays it graphically so you can see the growth—or decline—of your personal assets and liabilities. Net Worth Builder works with 1-2-3 for Windows and is available from Village Software for $69. —*D. A.*

6. Track Your Investments

Stock Investor Plus provides a clean, easy-to-use 1-2-3 for Windows worksheet template for managing stock transactions. Some of the key items on the main template include portfolios, reports, transactions, and capital gains.

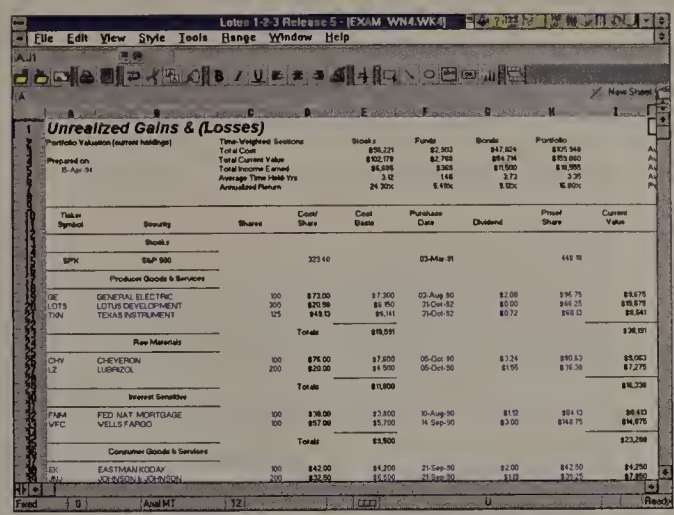
Stock Investor Plus supports a variety of stock and cash transactions, such as short sales, distributions, and stock splits. Clicking on the Portfolio menu item displays the current portfolio positions and all summary data, including gain-and-loss information. It also provides a number of reports. One is an alert sheet that notifies the investor of price objectives or when a stock price hits a specified amount. Detailed help screens are also provided for each template. Stock Investor Plus is available from Village Software for $99. —*Michael White*

7. Manage Your Stock Portfolio

Portfolio Management Made Easier With 1-2-3 lives up to its name. This 1-2-3 for Windows template uses dialog-driven prompts for the transactions entry; it also comes with an excellent manual that describes the underlying calculations driving the software package.

Portfolio Management includes nine templates, each of which contains a section for realized and unrealized gain and loss. Equity, mutual fund, and fixed-income summary information is displayed at the top of the spreadsheet. Support for cash balances and transactions is reflected in the money market balance.

Stocks are categorized into four industry sectors: producer goods and services, raw materials, interest-sensitive items, and consumer goods and services. Each time you enter a new equity transaction, you assign it to one of these sectors, and the worksheet is then automatically sorted based on these sectors. Bond analysis worksheets calculate projected bond values using cash flow from interest payments and the value of bonds at maturity. You can also view the performance of your portfolio over time using five predefined graphs.



MONITOR YOUR STOCK MARKET INVESTMENTS with Portfolio Management Made Easier With 1-2-3.

Despite the many features that have been added to 1-2-3, there is still a flourishing crop of add-ons that can help solve your spreadsheet problems.

Overall, Portfolio Management Made Easier With 1-2-3 is a solid value. It requires 1-2-3 for Windows and is available from DLH Software for $119. —*M. W.*

8. Forecast Your Financials

FastCast for Ventures is a much-expanded version of the Financial Statement SmartMaster that Village Software developed for 1-2-3 release 5.0 for Windows, and it works in release 4.*x*.

With this template, you can create forecasted balance sheets, income statements, and cash flows. And you can depict debt-to-equity ratios, income statement ratios, sales versus assets, and equity and asset ratios in graphical form.

Users may find FastCast a bit unwieldy at first. To use all its features, you must enter information in no fewer than 11 separate sheets. Furthermore, the product contains three separate worksheet templates—monthly, quarterly, and annual forecasts—and they aren't linked, so you must enter your data separately if you want to generate more than one forecast.

Despite these shortcomings, the graphics are presentation quality, the design elegant, and the calculations sophisticated. FastCast for Ventures, which works in 1-2-3 for Windows, is available from Village Software for $69. —*S. A.*

9. Monitor Your Company's Health

Village Software's Fast-Cast for Ventures includes one sheet of key financial ratios. If you need more, you can build your own ratio model with any version of 1-2-3 (see "How Healthy Is Your Business?", April 1995). Or you could take a look at Village Software's Ratio Evaluator—a menu-driven model with presentation-quality graphics.

Ratio Evaluator is easy to use. You fill in selected data from your financial statements and your ratio goals. The program automatically calculates ratios and prepares graphs comparing actual performance and goals.

Unfortunately, the template's elegance makes it difficult to modify. It comprises nearly 50 sheets, more than 500 lines of macro code, and elaborate formatting. For example, just adding a year to the model or setting up a new ratio requires considerable work.

The product has two significant omissions: You can compare actual figures to goals only with one graph of a ratio at a time, with no sheet for overall comparisons. Also lacking are same-size financial statements, a standard method of analyzing business results as percentages of revenue and assets.

Nevertheless, Ratio Evaluator is a well-turned piece of work. It works in 1-2-3 for Windows and is available from Village Software for $69. —*S. A.*

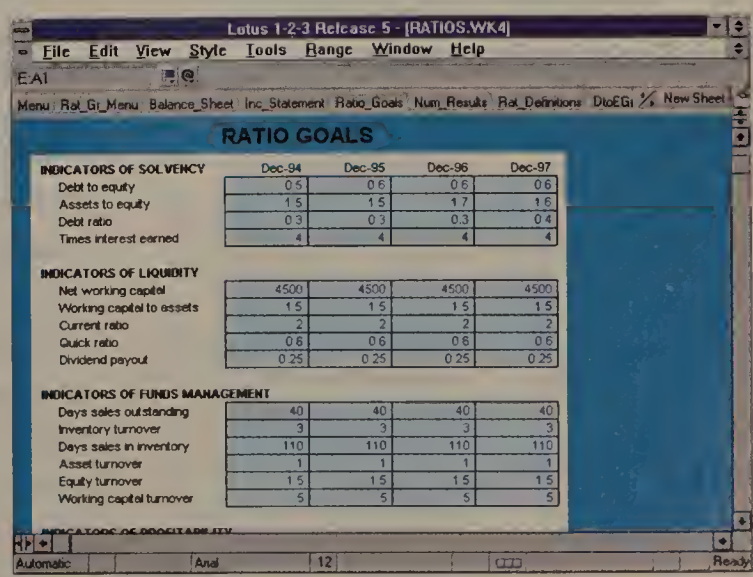
10. Pinpoint Business Solutions

The Business Troubleshooter FastAnswer helps spot business problems before they start. Modules include Bad Debt Markov Model, Bankruptcy Predictor, Business Interruption Insurance, Earnings per Share, and Buyout Estimator. Business Troubleshooter FastAnswer works in 1-2-3 for Windows and is available from Village Software for $59. —*S. A.*

11. Prepare for All the Possibilities

@Risk can help you navigate the murky "what if" waters by calculating a range of possible outcomes—and the likelihood of each—for almost any spreadsheet model.

To generate this output, the program substitutes values in the input cells you specify, recalculates the worksheet, and stores the result. It repeats this process as many times as you choose. The resulting list of possible outcomes can then be



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viewed graphically or analyzed statistically. For example, you can determine which inputs have the greatest impact on the outcome. You can also select a particular outcome (such as one in which your company goes bankrupt) and find out what set of inputs the program used to generate it.

After you run a simulation, the @Risk program window becomes active, allowing you to view inputs and outputs, create several types of charts from the output data, and save the results of the current simulation. @Risk is a stand-alone Windows program that runs in conjunction with 1-2-3 for Windows. (A separate, add-in version exists for 1-2-3 release 3.1 or higher for DOS.) @Risk is available from Palisade Corporation for $395. —*Kelly Conatser*

12. Analyze Capital Expenditures

CapPlans is a macro-driven template that allows you to analyze and chart the potential profitability of a capital expenditure over a 15-year period. Among the required inputs are rudimentary risk-analysis assumptions that enable you to analyze best- and worst-case scenarios, and sensitivity factors that can gauge the impact of a delay in the income or savings anticipated from the capital expenditure. CapPlans also generates an executive summary, a cash-flow statement, and an income statement.

Although CapPlans isn't overcomplicated, users who aren't well acquainted with capital budgeting may get lost in the thicket of detail the template requires.

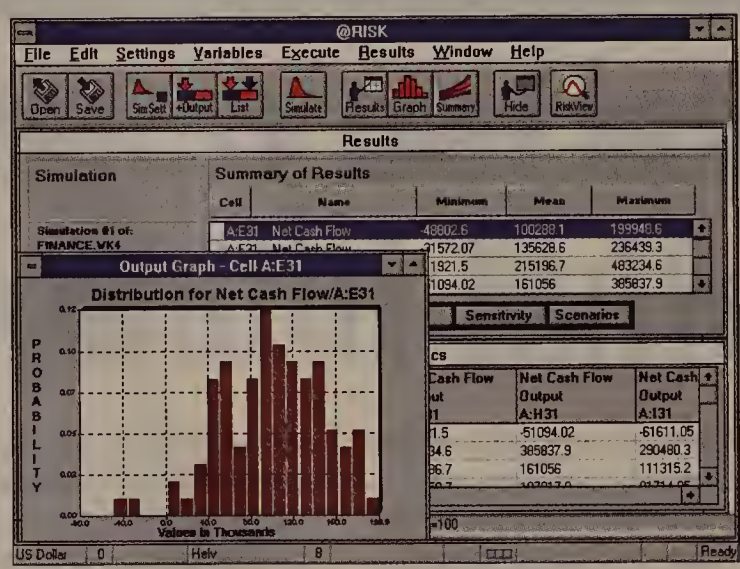
The documentation provides a general explanation for each input category but does not address specific entries and their impact on the bottom line. To help you sort through all this information, the program prints each input category (such as capital expenditures and labor costs) and output result (such as the sensitivity analysis) on a separate page. You can also print the template's four charts, which depict projected cash flows, present values, rates of return, and other statistics. CapPlans requires 1-2-3 releases 2.*x* and higher for DOS, and is available from Stephen Archer Associates for $240. —*K. C.*

13. See the Potential of Income Property

Property investment is always a complicated and risky venture, but Income Property Analyst offers an easy-to-use template that helps to determine whether or not a property would be a wise investment.

You begin by entering basic information about the investment, such as its cost, the type of property, the amount you're investing in it, and its age. Next, you enter expenses associated with the property such as loans and operating costs, along with income items such as the number of rental units or square footage available and the expected income for each unit. An estimate of the annual rate of increase for both expenses and income is also entered.

After all of the information is entered, the program produces a pro forma summary of income and expenses projected over ten years, and a recommendation as to whether or not the property is a sound investment. Income Property Analyst requires 1-2-3 releases 2.4 and higher for DOS and is available from Village Software for $79. —*D. A.*



EXPLORE ALL THE POSSIBLE OUTCOMES with @Risk.

14. Get More Demographic Data for 1-2-3

If you need additional data for mapping in 1-2-3 release 5.0 for Windows, look no further than Conquest Maps. Strategic Mapping's CD-ROM–based program includes demographic data sorted by five-digit zip code. Buy data for the entire country for $2499, or for each region—New England, Mid-Atlantic, Southeast, South Central, North Central, Midwest, Mountain, and West—for $399. —*Catherine Kenny*

Snap On New Features With These Utilities

If version 5.0 is any indication, playing feature catch-up seems to be the driving force behind each new software release. Adding cross-tab reports, version managers, and mail capabilities makes 1-2-3 more appealing, but some basic features have yet to make the cut. Fortunately, a variety of products can add much-needed functionality to 1-2-3, whether you're still in the early DOS versions or have made the leap to release 5.0 for Windows.

15. Open Locked Files

Ever forgotten a password for an important 1-2-3 file? Password Recovery from AccessData can help. To unlock a file, you simply run the Password Recovery system, specify the locked file's name, and select the type of file. Password Recovery then scans the file and returns the forgotten password. If you're unlocking several files at once, you can generate an output file containing file names and passwords.

Password Recovery can unlock password-protected worksheets for 1-2-3 releases 2.*x* and higher as well as for 1-2-3 for Windows. It is available from AccessData for $185. —*C. K.*

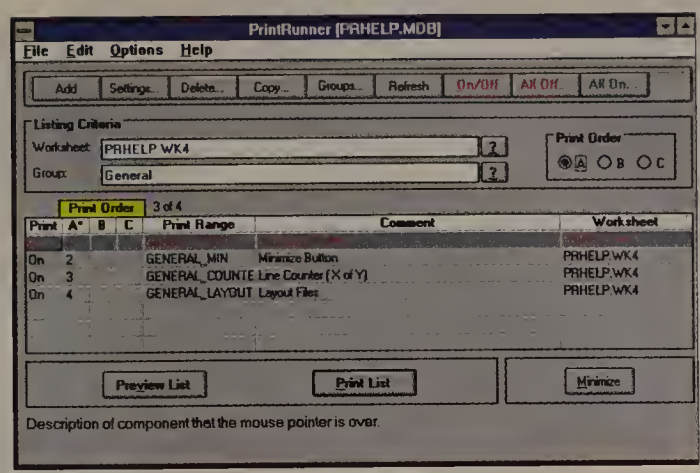
16. Manage Large Printouts

When you have large, unwieldy worksheets, the worst part of the job is printing. You must specify individual ranges and print settings every time you want to print. If you want to use different print settings within the same worksheet, you'll be tearing your hair out until you get it right.

Enter PrintRunner, a printing utility from Gravity Software. With PrintRunner, not only can you specify multiple print ranges, you can also use different print settings. For example, you can create different headers and footers, specify various margin settings, and even switch orientation for different parts of the worksheet.

To use PrintRunner, simply assign names to each worksheet range you want to print, and load PrintRunner from the SmartIcon palette. Then add each range to a special PrintRunner database, attach comments, and assign print settings. You can turn individual ranges on and off so you only print the ranges you want. PrintRunner also allows you to print ranges from different worksheets.

PrintRunner requires 1-2-3 for Windows releases 4.*x* and 5.0 and is available for $59 from Gravity Software. —*C. K.*



MANAGE MULTIPLE PRINT RANGES with PrintRunner.

17. Translate Data Into 1-2-3

One of the most common functions of 1-2-3 is its ability to massage and manipulate data from multiple sources. But 1-2-3 falls short in helping you get the data you need. If you can save the data in ASCII format, DataImport 4.0 for Windows can help make sense of it all. To use DataImport, you simply open the report file, indicate the data you want to work with, and then run the Translate program to extract the data into 1-2-3. If you want to work with a subset of the data, you highlight the data, and then use the Include and Exclude menus to narrow in on the data in question. DataImport 4.0 for Windows is available from Spalding Software for $189. —*C. K.*

Oldies but Goodies

If you haven't yet upgraded your release of 1-2-3, take a look at these tried-and-true add-ons, available for releases 2.*x* and 3.*x* for DOS.

18. Annotate Your Worksheets

NoteWorthy lets 1-2-3 release 2.*x* users annotate worksheet cells. The word 'Note' appears in the status bar when the cell pointer is placed in an annotated cell. You can also view notes for an entire worksheet once you've opened the Note window. You can copy and move data from the Note window to the worksheet and vice versa, as well as search and replace text. And if you need to move the contents of a cell, you can move the note along with it. Each note holds up to 8000 characters. NoteWorthy is available from Funk Software for $79.95. —*C. K.*

19. Debug Formulas

1-2-3's extensive collection of @functions makes it easy to create virtually any type of worksheet calculation. However, if you need to edit a formula or change some of its components, 1-2-3 is less than helpful.

Formula Editor makes it easy to write and debug complex formulas directly within 1-2-3 by supplying the entire formula within the Formula Editor pane. You can use standard editing keys to edit portions of the formula and use Calculate Mode to calculate portions of it. You can also view descriptions of each @function, making it easy to learn how to use them. Formula Editor also lets you display long cell entries and macro commands in their entirety. Formula Editor is available from Funk Software for $99.95. —*C. K.*

20. Get the Bigger Picture

Release 2.*x* users, who've lived in the single-worksheet world for a long time, will appreciate SeeMore. With it, you can create multiple windows so you can see different areas of the worksheet at the same time. You can also work in each window independently of the others, switch between worksheets, hide certain worksheets, and zoom in on worksheets. SeeMore is available for $99 from the Personics division of Datawatch Corporation. —*C. K.*

21. Start a Collection of @Functions

If you find the @functions in 1-2-3 releases 2.*x* and 3.*x* lacking, why not boost your collection with additional @functions? GreyMatter International produces various libraries of @functions ranging from the general to the more specialized.

The General Applications Library contains 48 @functions, including financial and mathematical ones, more versatile lookup functions, and statistical functions. The Scientific and Engineering Library offers more specialized @functions, including trigonometric, beta, and gamma functions. The Statistical Library includes t-tests, variance, and others. Each library is sold separately for $79.95 from GreyMatter International. —*C. K.*

Steve Adams is a freelance writer in Raleigh, North Carolina. David Aden is vice president of Information Services for Sportsmed in Quincy, Massachusetts. Kelly Conatser is a spreadsheet consultant in Kenner, Louisiana. David Maguiness is a technical writer for a major software consulting firm. Michael White is an application architect for Fidelity Investments Institutional Services in Boston. Catherine Kenny is an associate editor for PC World Lotus Edition.

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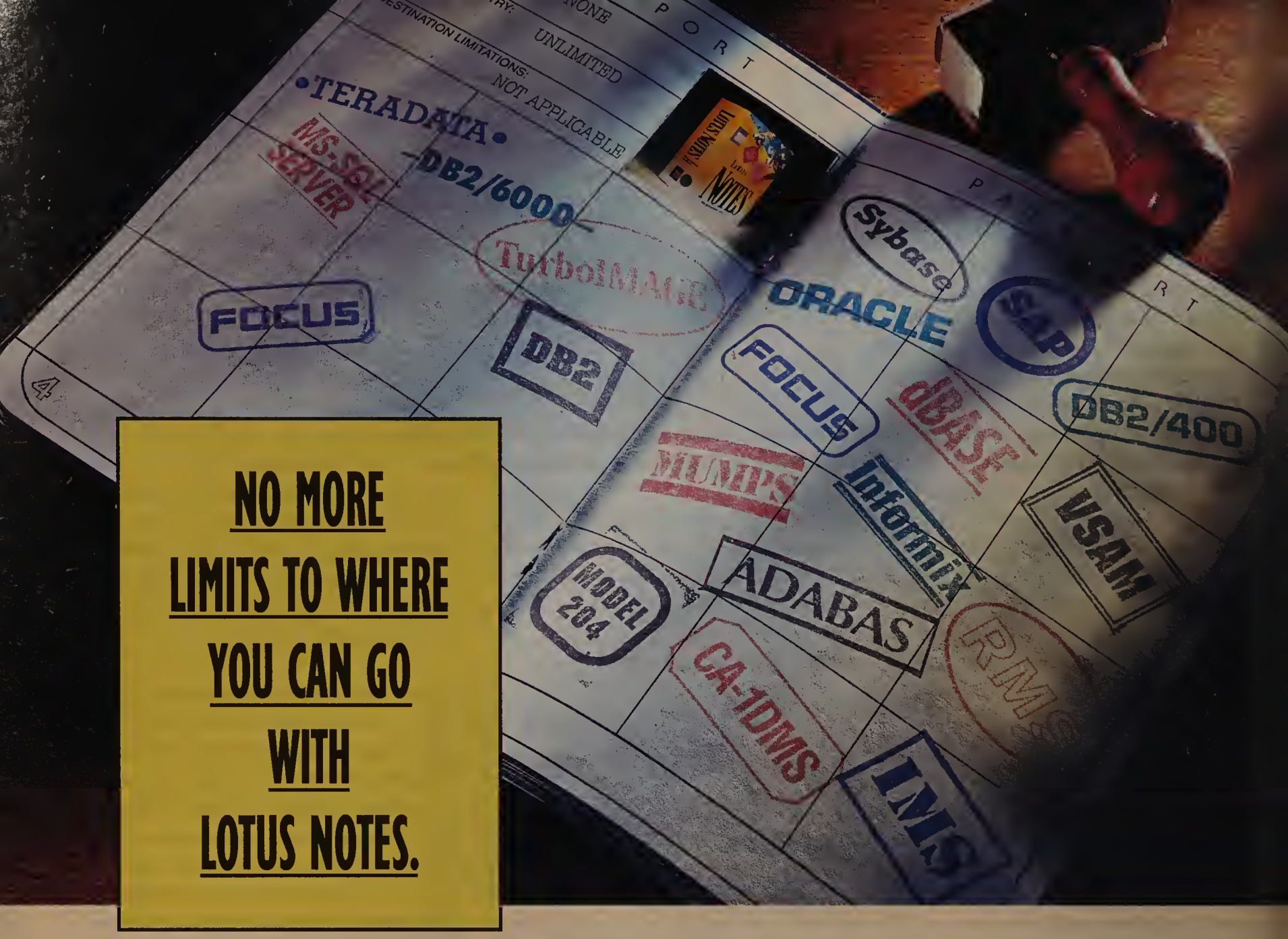

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THE CHEAPSKATE'S GUIDE TO 1-2-3 ENHANCEMENTS

Go online for the best 1-2-3 bargains.

If you want to get the most from 1-2-3 but hate shelling out for shrink-wrap software, we've got some good news for you.

1-2-3 is the oldest of grass-roots software communities, and aficionados have been writing and swapping enhancements for it for more than a decade. Today you can sample a rich harvest of ready-made applications and utilities—debugged and waiting to be downloaded from user group bulletin boards, online services, and software libraries around the country. With an online or user group membership, you can roam through hundreds of 1-2-3 files to find the one utility that can solve your problems or the one application that may save you weeks of reinventing the wheel. (Some authors do ask for a royalty if you use their models, however.)

BY TRACY MAYOR

User Groups Give the Best Value

1-2-3 maintains a strong presence in user groups, many of which keep a library of downloadable files, templates, and utilities. Below are profiles of a few of the more than 75 user groups nationwide that maintain active 1-2-3 special interest groups (SIGs). To locate a user group near you, call the Association of Personal Computer User Groups at 914/876-6678, call Lotus at 617/693-1606, or see "Annual National Guide to PC User Groups" (*Consumer Watch,* October 1994).

The Atlanta PC Users Group maintains a bulletin board and a software library that contains more than 1 gigabyte of data, organized into 39 categories, according to Jim Oest, a spreadsheet specialist affiliated with the group. Members can log on and search the database for relevant material, including 1-2-3 files. Membership costs $40 a year and entitles you to unlimited access to the group's online files, plus the other benefits user groups offer. The Atlanta group can be reached at 404/393-1629. Nonmembers can log on to the bulletin board at 404/414-4400 for 20 minutes of exploratory time before deciding if they'd like to join.

The software library at the Capital PC User Group, which serves Washington, D.C., and its surrounding suburbs, works a bit differently. Members select the software they want, and the group librarian copies the files onto a disk for $5. In addition, other files, such as those printed in the group's monthly *Monitor* magazine, are available to members online, as is a bulletin board (301/738-9060) where members can post specific questions, says Roy Rosfeld, leader of the group's Lotus SIG. User group membership is $35 a year; the group can be reached at 301/762-9372.

The Central Florida Computer Society's library offers members access to tips, techniques, and popular shareware programs, says Leo Rodgers, leader of the group's spreadsheet SIG. Members bring in a disk or pay $2.50 per disk plus any relevant shareware fees. Yearly dues are $25, and the group can be contacted at 407/332-2883.

CompuServe Provides Plenty–For a Price

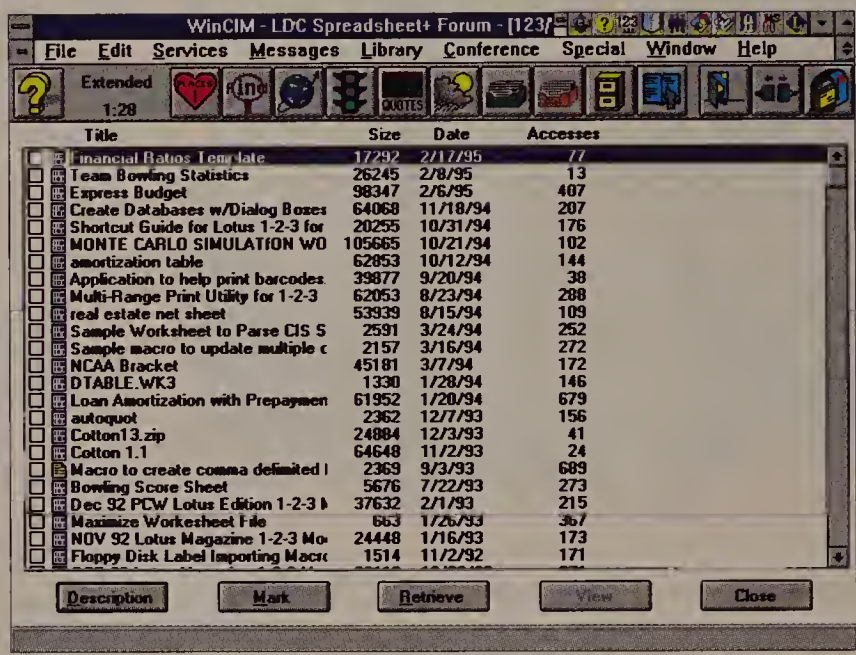
A more expensive—but more expansive—option is the CompuServe online service. Typing **go lotus** takes you to an abundance of applications, utilities, technical notes, upgrades, and discussion threads, all officially sanctioned and watched over by Lotus Development personnel. The service doesn't come cheap, however. At $8.95 per month for a basic CompuServe membership plus $4.80 per hour to access the World of Lotus, which is an extended service billed at an hourly rate, online costs can quickly add up unless you're careful to watch the clock.

One big plus: Your 1-2-3 documentation lists an easy way to save yourself nearly $40. If you join CompuServe by responding to a print advertisement or calling the company directly, you're charged $39.95 for a "membership kit," which consists of the CompuServe Information Manager software, a user ID, and a password. That fee is waived if you ask for operator 226 when you call CompuServe at 800/848-8199.

Lotus maintains ten CompuServe forums, including three that are of special interest to spreadsheet developers: the LDC Spreadsheet Plus Forum, the Lotus Technical Forum, and the World of Lotus Information Service. If it's applications and utilities you're after, head for the Spreadsheet Plus Forum. Its 17 libraries include models for DOS releases 2.*x*, 3.*x*, and 4.*x*; 3 separate libraries for 1-2-3 release 4.*x* for Windows technical notes, applications, and general information; a similar breakdown for 1-2-3 release 5.*x* for Windows; and libraries for 1-2-3 for OS/2, 1-2-3 for Mac, and the Add-In Toolkit.

The release 2.*x* for DOS library boasts the most files—some 225 files to download. In addition to nonapplication files such as printer driver updates, product status reports from Lotus, and supported-device lists, popular downloads include a release 2.01 amortization worksheet that calculates additional payments of varying amounts (**amort1.zip**), a lease versus buy worksheet (**lsvbuy.zip**), a 1-2-3 based personal information manager (**pim.zip**), and a worksheet that tabulates and plots blood glucose levels for diabetics (**glucle.wk1**).

The 1-2-3 release 4.*x* for Windows application library offers about 50 files (see **FIGURE 1**). Favorites include a financial ratios worksheet template (**cfrati.zip**), a budget for personal use with built-in financial and math calculators (**expres.zip**), and a bowling league score sheet (**bowl34.zip**). The release 3.*x* library contains slightly fewer files, and most of them are tips, techniques, and technical documents. There are few actual applications or worksheets, though users will always be interested in offerings like a 1-2-3–based work-around for the Pentium flaw and the chk1-2-3 hardware-system evaluation utility.



LOTUS'S COMPUSERVE FORUMS OFFER PLENTY of downloadable applications, plus valuable advice from other users.

The same goes for release 4.*x* for DOS, which serves up just four files of installation how-tos, third-party drivers, memory fixes, and a spelling checker correction.

Through CompuServe, you can also gain access to Public Brand Software (PBS), a vast library of games, freeware, shareware, and utilities, covering a wide array of topics. PBS's 1-2-3 offerings, about 35 altogether, are mostly utilities, though some full-blown applications are included as well. PBS is accessible via ZiffNet, a separate service you can get to from CompuServe's basic services menu (**go ziffnet**). Membership is $3.50 per month in addition to the CompuServe membership fee, and hourly connect charges are $4.80.

Other Online Offerings

PC World Lotus Edition is the most thorough source of 1-2-3 applications in print. All models and applications published in the *Lotus Edition* are available for downloading from PC World Online, which is available through CompuServe (**go pcworld**) and America Online (**pc world**).

Also check out the Applications Forum on America Online. The computing library section (**software/libraries**) features two areas worth noting. The Spreadsheet Programs and Utilities area lists about 20 1-2-3–related files, including Total Investor for 1-2-3 and Map 123, a program that provides a geographic map of the data in any wk1 worksheet. The Spreadsheet Templates area offers about the same number of files, including retirement and financial planning shareware, and a cash-flow analysis that has garnered much interest from users. You can reach America Online at 800/827-6364.

Prodigy's Computers section maintains no application libraries, but it does provide a bulletin board, and it also offers access to ZiffNet. Membership in Prodigy is $9.95 per month for 5 hours of connect time. Additional connect time costs $2.95 per hour or 5 cents per minute. Prodigy's number is 800/776-3449.

Don't forget about other online services such as Delphi (800/695-4005) and the many veteran bulletin board services. While you probably won't want to join up just to obtain 1-2-3 software, you may find some gems lurking in the vast reaches of these services' files.

Tracy Mayor is a freelance writer in Beverly, Massachusetts.

GET THE SUPPORT YOU NEED

Confused by all the options for tech support? Here's how to choose.

By Anne Fischer Lent

Have you ever called Lotus just to say you love the company? Probably not. Even if you're delighted with its products, you probably come into direct contact with the company only when you encounter a problem—whether that problem is a spreadsheet that doesn't do what you expected, a program that locks up on a particular PC, or an indecipherable error message. And if you're like most users, your experiences with a company's technical support play a major part in determining how you feel about that company and its wares.

Overall, Lotus does reasonably well at solving its customers' technical problems: In a *PC World* survey conducted earlier this year, 85.8 percent of users who had called Lotus tech support during 1994 said they were very or somewhat pleased with the overall quality of the help they received. That figure is comparable to the satisfaction rates reported by Microsoft and Novell users.

The street price you pay for a copy of 1-2-3 is cheaper than ever, but extensive free support isn't part of the bargain. You get only 90 days of no-cost help for Lotus's desktop applications, and you pay for the phone call. After that period is up, you pay for Lotus technical support in addition to any toll charges.

To make sure you don't overpay for support, find out what types of packages are available, and pick the one that's best for you. Lotus's fee-based plans offer a tremendous range of options, from services that charge only when you use them, to plans you pay for by the year that provide nonstop support for every PC in the company (see "What's on the Lotus Support Menu" for a summary of these and other Lotus support plans and their costs). "What

JEFF BRICE

Third-Party Support Can Be the Way to Go

Automobile dealers may argue to the contrary, but most of us know that the companies that sell us our cars don't always provide the most convenient, cost-effective service when trouble crops up. A growing number of PC users have decided the same holds true for software, and they're turning to third-party support organizations for software help. Some of these firms are listed in the box below.

These companies provide a variety of support plans for all Lotus products at prices similar to Lotus's. For example, Lotus's standard single–end-user contract for desktop programs costs $195 a year, while a similar plan from Software Support costs $199.95.

But while Lotus delivers help only for its own products, for the same $199.95 price, Software Support offers assistance for more than 150 Windows, DOS, OS/2, and Mac applications from multiple vendors. This versatility should make Software Support plans well suited to resolving conflicts between programs from different vendors as well as for dealing with basic configuration issues for Windows and other operating systems.

As corporate customers face the prospect of soaring technical support costs and ever-dwindling free options, the market for these alternative support providers has boomed. According to a study of 221 corporations conducted by the research firm Dataquest, 40 percent of a typical corporation's annual budget for software support now goes to third-party organizations rather than to the vendors who provide the software. Joe Jacoboni, CEO of Software Support, estimates that his company has grown at least 100 percent each year since 1991, and he expects to see a growth rate of 300 percent this year. —A. F. L.

Lotus is doing basically is unbundling its maintenance programs and letting us buy the pieces that we want," says John Manning, director of corporate systems at Union Pacific Technologies in St. Louis.

Phone Support

Lotus's 90 days of free introductory support for its desktop applications may well be all you need to get up and running and to sort out any installation and configuration problems. The 90-day period doesn't kick off until you place your first call for help. However, long after this period has expired, you will probably have more questions as you explore a product's advanced features.

When that happens, the simplest option is to use one of Lotus's pay-as-you-go services. Rather than signing a long-term service contract, you simply pay for support as you need it, either by calling a 900 number that charges by the minute, or by paying a flat per-incident rate with a credit card. Costs for these options range from $2.95 per minute for 900-number desktop application support to $175 per incident for assistance with issues involving complex Notes applications.

You might expect costs for pay-as-you-go support to mount quickly, but for Dr. Ron Miller, medical director of the Dorothy Adler Geriatric Center at Yale/New Haven Hospital in Connecticut, they're a justifiable expense. Miller's staff uses the pay-as-you-go plan sparingly, "but when we've had to, it's been worth the fees." As Miller sees it, when a hospital employee encounters trouble performing a vital business function, the clock is ticking and money is being wasted. It makes sense to call Lotus technical support for assistance and pay the price, because "it's not worth paying a programmer or a highly trained manager to spend time sorting out the problems."

The more frequently you need to call for help, however, the more likely it is that one of Lotus's support contract plans—most of which provide unlimited help at a fixed price for a year—will be more cost-effective than a pay-as-you-go arrangement. The plans range from basic desktop application support for a single user at $179 per year all the way to Support Account Management (SAM), a $35,000 program that assigns a permanent Lotus support representative to work closely with the customer's internal help-desk staff to help solve problems.

THIRD-PARTY SUPPORT FIRMS

Corporate Software
617/440-1000
Reader service no. 732

Keane
404/395-7740
Reader service no. 733

National Tech Team
313/277-2277
Reader service no. 734

Softmart
610/524-7440
Reader service no. 735

Software Support
407/333-4433
Reader service no. 736

Sykes Enterprises
303/522-6638
Reader service no. 737

Since most of these contract plans cost the same regardless of usage, they're targeted at companies for whom time and efficiency are prime considerations. At Union Pacific, for instance, it's more important to have immediate access to expert help than to pay the lowest possible up-front price. "We want to pay one maintenance fee and get the services that we need," says John Manning, who is currently considering moving to SAM or another of Lotus's Passport plans. (Union Pacific's current support contract with Lotus is a custom agreement, whose price is based on the total number of users in the company.)

Electronic Support

Some software problems are best resolved by speaking directly with a real live technical-support representative, but many users recommend Lotus's electronic support options, which include CompuServe forums, a bulletin-board service, and an automated fax help line. These options are plentiful and inexpensive. They're up and running seven days a week, 24 hours a day. (Support over

the Internet should also be available by the time you read this.) Lotus estimates that one-third of its support is provided in some electronic fashion today, and it expects that proportion to grow.

The re:Quest free automated fax service for desktop applications offers thousands of documents. You can either identify a specific document via the company's touch-tone–telephone search facility or request that the entire index of documents be faxed to you. But be warned: At its current 29 pages, the index will keep your fax machine occupied for a while.

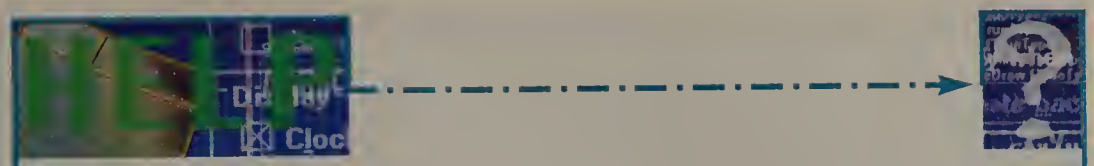
Lotus's bulletin board service offers an even wider array of documents, including utilities, print drivers, press releases, and information about its entire line of software products, but as yet, no interactive chat line.

For more straightforward problem solving, the Lotus Technical Forum on CompuServe lets you search through Lotus Development's tech notes database by subject, keyword, date, and other criteria, and the World of Lotus bulletin board provides direct access to members of Lotus's tech support staff as well as other spreadsheet subscribers.

CompuServe and BBS help is offered for an unlimited period, with no fees other than standard CompuServe charges and the cost of a toll call to the BBS.

It's not just electronic support's low cost and ready availability that appeals to users, though. 1-2-3 guru Nick Delonas, a spreadsheet consultant in Ramsey, New Jersey, is a former Lotus employee; when he's stumped by a technical matter, it's often an issue so murky that Lotus's phone support can't help. So Delonas turns to the Lotus forum on CompuServe for solutions to his problems, advising that "if you've got a modem and can wait for an answer, the CompuServe forum provides the highest level of expertise and the most superior support." (See "Help From Real Users.")

One other electronic option is aimed at organizations that want to solve even the stickiest problems themselves: KnowledgeBase, a Notes database of the same technical information on Lotus products that the company's support representatives use. Intended for help desks, engineers, programmers, and other advanced users, KnowledgeBase is available in both online and CD-ROM versions and costs $295 a year.



Help From Real Users

Spreadsheet veterans know that sometimes the best solution to a problem comes from another user. And the best way to reach the largest number of fellow users is by participating in online forums.

To test the responsiveness of various spreadsheet chat forums, we posted the following query on America Online, Prodigy, CompuServe, and the Internet: "I am trying to write a formula that will round a value to the nearest half-dollar (that is, to 50 cents rather than a dime or a dollar). Any suggestions?" (For the correct answer, see the end of this sidebar.)

AMERICA ONLINE **Spreadsheet users can choose from four AOL forums—DOS 2.*x* and 3.*x*; DOS 4.*x*; Windows 4.*x*; and Windows 5.0. Traffic was heaviest in the 2.*x* and 3.*x* forum, which had 164 messages posted when we logged in. The DOS 4.*x* forum where we posted our message was decidedly less populated. In 72 days, we received only one reply to our query. Participants in all four forums helpfully shared tips on topics such as sorting from right to left, disconnecting and connecting cells, and dissecting the {let} macro command.**

PRODIGY **This service, which offers the least computing content, also yielded one reply in 72 days from its Spreadsheet bulletin board. Members seemed relatively active and prompt in trading advice back and forth on a range of beginner and intermediate problems and were friendly and informal in their delivery.**

COMPUSERVE **Lotus forums are heavily used and the level of expertise high on CompuServe. Our query was answered within a few hours—by a Lotus technical support person. But therein lies an irony. Because CompuServe's Lotus forums are monitored closely by Lotus Development, you're sure to get an answer—most likely, an officially sanctioned "correct" answer—but informal give-and-take among far-flung spreadsheet colleagues is noticeably lacking. When the teacher's in the room, the students are less likely to speak up.**

INTERNET'S USENET NEWS GROUPS **These resources are similar to the bulletin board systems offered by CompuServe and other commercial services. There are thousands of news groups to choose from; your ability to access them will vary depending on what service you use to connect to the Internet.**

When looking for help on spreadsheets, the definitive news group to subscribe to is comp.apps.spreadsheets, which covers all platforms. It doesn't take much "lurking" (reading messages without sending any) to determine that Net spreadsheet users see more similarities than differences among applications. So don't waste time looking for more specific news groups.

Using comp.apps.spreadsheets proved one of the quickest ways to get a solution to our problem; we got an answer from a helpful net surfer within a couple of hours of issuing our query. There is a steady posting of question-and-answer-type articles, and responses to questions are so quick and so easy to read, you may find yourself browsing through subjects in which you have no direct or immediate interest. Not all answers to posted questions are returned via the news group, however.

By the way, according to *PC World Lotus Edition* senior associate editor Richard Cranford, the correct answer to our query is divide by 0.5, round to 0 decimal places, then multiply by 0.5. Thus, if the value to be rounded is in cell A1, you'd use the formula @round(a1/0.50,0)*0.50.

—Tracy Mayor and Nicole Wolohan

What's on the Lotus Support Menu

Unless otherwise specified, all plans are available 8 a.m. to 8 p.m., Monday through Friday, except for cc:Mail plans, which are available 8:30 a.m. to 8 p.m., Monday through Friday. List prices provided. For more information, contact Lotus at 800/553-4270.

SUPPORT OPTION	DESKTOP PRODUCTS	COMMUNICATIONS PRODUCTS
Introductory	▶ Free introductory support for first 90 days: 508/988-2500 (Windows), 508/988-6400 (DOS), 508/988-2820 (OS/2)	▶ Free introductory support for first 30 days: 508/988-2750 (Notes), 415/966-4900 (cc:Mail)
Automated	▶ re:Quest free automated fax help 24 hours a day, seven days a week: 800/346-3508	▶ re:Quest free automated fax help 24 hours a day, seven days a week: 800/346-3508 (Notes), 415/966-4951 (cc:Mail)
Online	▶ Free bulletin board service 24 hours a day, seven days a week: 617/693-7000 ▶ CompuServe help at standard connect charges: **go lotus**	▶ Free bulletin board service 24 hours a day, seven days a week: 617/693-7000 (Notes), 415/691-0401 (cc:Mail)
Pay-as-you-go programs	▶ Toll support: 900/555-6887; $2.95 per minute, $50 maximum per call ▶ Per-incident support: 800/553-4270; $35 per incident	▶ Per-incident Notes support: 800/346-6388, $50 per incident; advanced questions (multiserver and database design issues) 800/437-6391, $175 per incident
Individual end-user programs	▶ 12 x 5 Business Hour Service: toll-free priority support for all desktop products; $179 per year ▶ 24 x 7 Around-the-Clock Service: toll-free priority support for SmartSuite programs, Improv, and 1-2-3 for DOS, 24 hours a day, seven days a week; $195 per year	▶ Toll-free priority support: $495 per year per Notes or cc:Mail user
Corporate end-user programs	▶ Same as 24 x 7 plan for multiple users in a company; $995 per year for 6 to 24 users to $12.49 per year per user for 1000 or more users	
Passport programs	▶ Unlimited plans: provide a single help-desk staffer with unlimited toll-free access to a senior Lotus technical support representative; $1795 per year (all desktop products), $3995 (cc:Mail), $4595 (Notes), $5495 (all desktop and communications products) ▶ Limited plans: same as unlimited plans with 20-call cap; $695 (all desktop products), $3295 (cc:Mail), $3495 (Notes), $3695 (all desktop and communications products) ▶ Support Account Management (SAM): permanently assigned representative visits customer site to analyze its PC environment; five employees can make unlimited calls; $35,000 per year ▶ Field Support Services: provides senior technician for five days of on-site support, for response to urgent problems, for analysis of long-term needs, and for other services; price depends on project	
Other	▶ Free TDD support for the hearing impaired: 800/457-0909	

Devising a Support Strategy

You might not require help now, but when you do, it pays to have a support plan in place. Failure to commit to some kind of system can be costly: According to a 1994 report from the research firm Dataquest, 221 companies reported one-year support expenditures of approximately $4700 per user. The biggest cost was accounted for by time that was lost while workers tried to support each other.

That's not to suggest users can't assist one another effectively. Indeed, that's part of the system Yale's Dorothy Adler Center uses to resolve problems. Medical Director Miller has designated certain employees as support liaison for each Lotus product. For Notes, the support person is usually a programmer; for other applications, support is provided by an advanced user. Lotus encourages the strategy of designating workers to make support calls: It offers support contracts priced according to the number of people within an organization who are authorized to place calls for help.

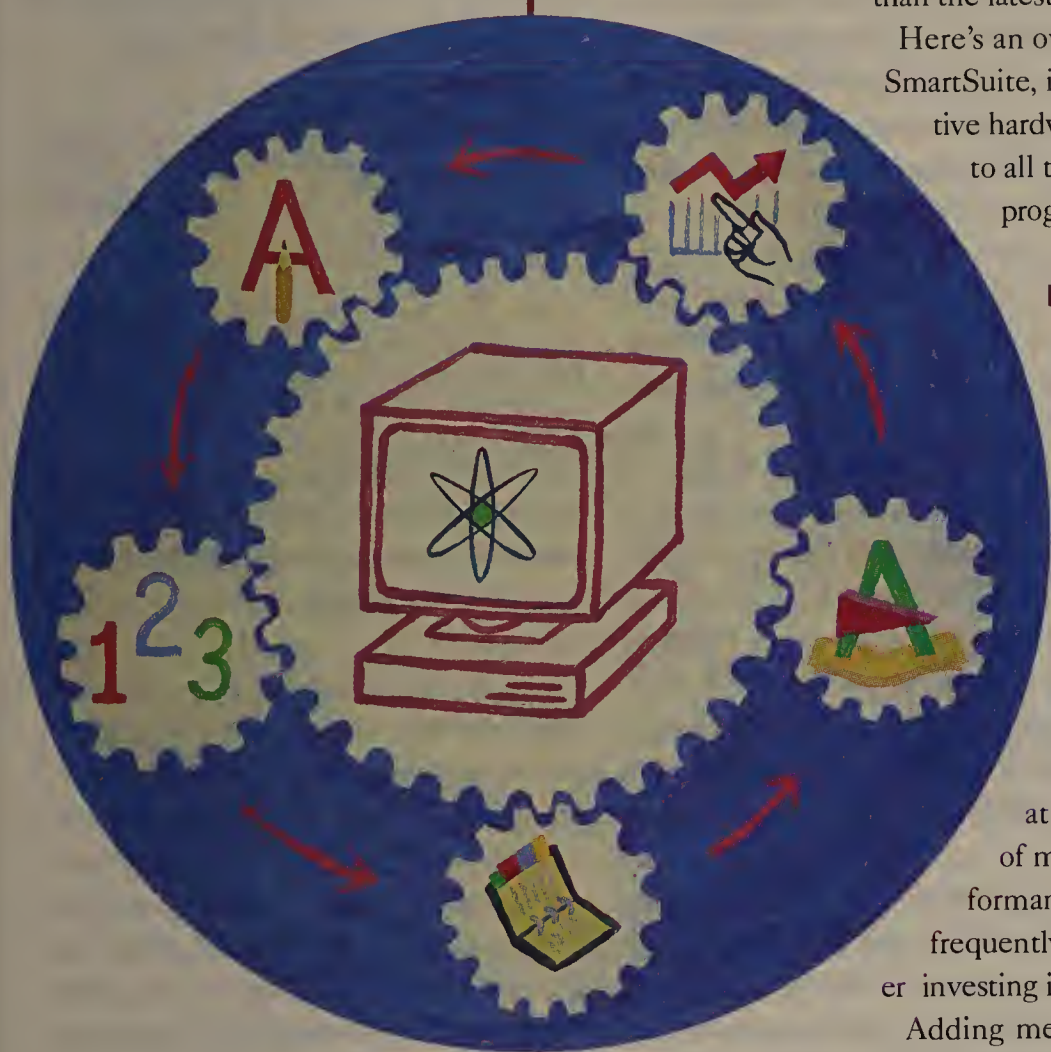
When users at the Dorothy Adler Center encounter difficulty with a Lotus product, they notify the appropriate liaison, who then logs on to a Lotus online support service or calls Lotus phone support (using a pay-as-you-go plan). According to Miller, limiting the number of people who call for support allows seasoned users, who can ask educated questions, to get to the root of the problem quickly. They can also teach others at the Center to solve simple problems by themselves.

As you devise your own technical support strategy, consider your needs and match them up with the services listed in "What's on the Lotus Support Menu." If none of the existing plans meet your requirements, Lotus says it will tailor a plan for your organization. For more information on support options or advice on the best ones for you, call the company at 800/553-4270.

Anne Fischer Lent writes about using computers in the real world and is the author of The Ultimate Desktop Publishing Starter Kit *(Addison-Wesley, 1995, 617/944-3700). Tracy Mayor, a freelance writer in Salem, Massachusetts, and Nicole Wolohan, an information broker in Ames, Iowa, contributed to this story.*

For more information about all support firms in this article, circle reader service no. 914.

GIVE YOUR PC a SmartSuite TUNE-UP



Optimize your hardware and software to get the most zip from Lotus's Windows programs.

BY REID GOLDSBOROUGH

BRIAN CAIRNS

SmartSuite applications boast a common look and feel and shared components that make them great productivity enhancers. But you can get even better productivity from the suite by tweaking your PC with SmartSuite in mind. The resulting performance boost can be especially dramatic if your computer is a reliable old 386 or 486, rather than the latest DX4 or Pentium speed demon.

Here's an overview of the best ways to configure your system for SmartSuite, including both software tricks and the most cost-effective hardware upgrades. First, we'll look at techniques that apply to all the SmartSuite programs, then we'll offer tips for each program—1-2-3, Ami, Approach, Freelance, and Organizer.

Basic SmartSuite Adjustments Compared with many of today's gluttonous Windows applications, SmartSuite has relatively modest hardware requirements. There's always a difference, though, between minimum requirements and acceptable ones. Lotus says you can run SmartSuite with as little as 4MB of RAM, but you'll be able to run only one application at a time. You need 6MB to run multiple programs simultaneously, and upping your RAM to 8MB will improve performance even more, since Windows will devote less time to the sluggish task of reading and writing to its swap file. However, unless you run more than four applications at a time or create very large files, adding more than 8MB of memory won't result in markedly better SmartSuite performance. But keep an eye on your PC's hard disk light. If it frequently flashes when you're not loading or saving files, consider investing in some additional RAM.

Adding memory costs money, but several other techniques can make the most of your PC's existing resources. You'll get the fastest performance if Windows' Enhanced mode is set to use a permanent swap file, which uses a contiguous block of hard disk space; a temporary swap file, by contrast, quickly becomes fragmented (read slow) because it uses whatever chunks of disk space happen to be available.

To make sure you're using a permanent swap file while running Windows, double-click the 386 Enhanced icon in the Windows Control Panel. In the resulting dialog box, click the Virtual Memory button. Click the Change button in the Virtual Memory dialog box (shown in **FIGURE 1** on the next page), then make sure the Type box is set to Permanent rather than Temporary or None.

Windows will recommend a swap file size, in kilobytes, based on the amount of RAM in your system and the amount of free space on your hard disk. (A permanent swap file cannot be larger than the amount of contiguous free space on the chosen drive; you may want to defragment that drive with a program such as DOS's DEFRAG before setting up your permanent swap file.) You can either accept its suggestion by clicking OK, or specify a smaller or larger swap file size. At the very least, create a swap file that is as large as the amount of physical RAM you have. If you run several SmartSuite programs

simultaneously, make the swap file twice as large as your physical RAM. (Don't create a swap file this large if you don't need it; your performance may decrease, and you'll waste hard disk space.)

While you're creating a permanent swap file, you can enable 32-bit disk access, and—if you're running Windows for Workgroups 3.11—32-bit file access. Just check the appropriate boxes in the same Virtual Memory dialog box. Both options pep up disk-related activities in SmartSuite and other programs—the first by replacing BIOS disk functions with a faster 32-bit protected mode driver, and the latter by replacing SmartDrive's nonfloppy functions with a protected-mode cache.

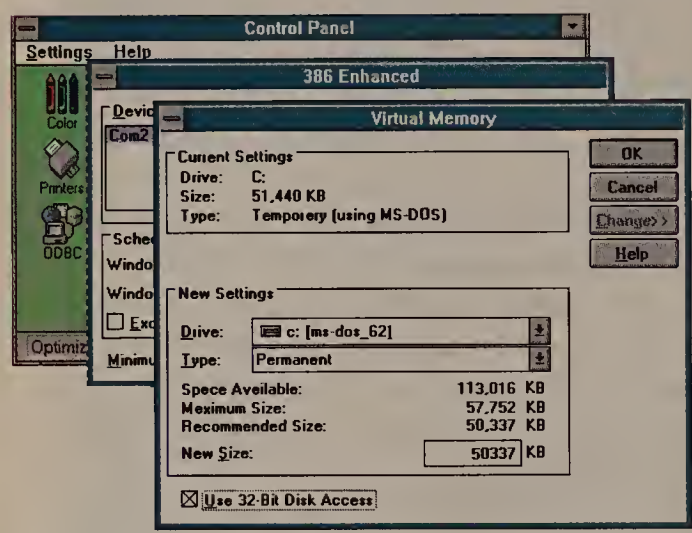


FIGURE 1: A PERMANENT SWAP FILE Improves SmartSuite performance, as do 32-bit disk access and 32-bit file access, if your system is properly equipped.

Be aware, though, that you won't be able to use 32-bit disk access if you don't have the right hard disk adapter; SCSI and ESDI drives, for instance, are not supported. (In these cases, the option may not appear at all.) And with Windows for Workgroups 3.11's 32-bit file access, you won't be able to undelete accidentally erased files or run a number of other disk utilities from within Windows.

If you've built an enormous library of TrueType fonts on your hard disk, consider deleting the ones you never use. The more typefaces you have installed, the slower your applications will run. Double-click the *Fonts* icon in the Windows Control Panel to bring up the dialog box shown in **FIGURE 2**. Scroll through the Installed Fonts list, highlight the unwanted ones, and choose *Remove;* this deletes the selected fonts from memory but not from your hard disk. (If you might want to use a font later, make sure the Delete Font File From Disk check box in the Remove Font dialog box isn't selected.)

If you're a longtime SmartSuite user, you may have installed Adobe Type Manager, the font utility bundled with earlier versions of SmartSuite and individual Lotus programs. Disabling ATM and using TrueType alone will free up RAM and system resources; since SmartSuite now comes with 25 TrueType fonts, you'll still have plenty of typefaces from which to choose. (However, if you use a PostScript printer, you'll find that ATM fonts print faster than TrueType ones.)

To disable Adobe Type Manager, double-click *ATM Control Panel* in Program Manager's Main group, and choose *Off*, as shown in **FIGURE 3**. You can free up some disk space by wiping out the associated font files, which are usually located in the \PSFONTS directory.

1-2-3 Releases 4.x and 5.0 for Windows Like all spreadsheets, 1-2-3 is a calculation-intensive program that benefits from a fast processor and a math coprocessor. If you have a PC without a math coprocessor—a 386SX, 486SX, or 486SX2—adding the proper model of coprocessor is a simple, fairly inexpensive upgrade that can speed up 1-2-3 tasks such as recalculations.

It can also pay to replace your computer's CPU with a faster model, such as those available from Cyrix, especially if you're running 1-2-3 on an aging 386SX or 386DX. Although the upgrade is trickier, you'll get even better performance by replacing your entire motherboard with a more modern model built around a 486 or Pentium processor. Keep an eye on costs, though; if the total price of the upgrades you're considering exceeds 40 percent of the price of a new system, it's generally more cost-effective to buy a new computer.

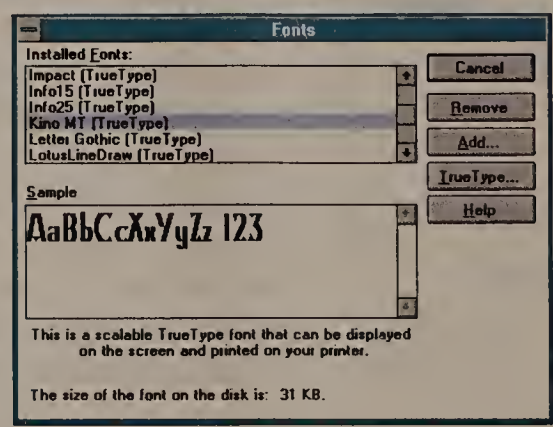


FIGURE 2: INSTALLING TOO MANY FONTS slows down SmartSuite. Be smart and remove the ones you don't use.

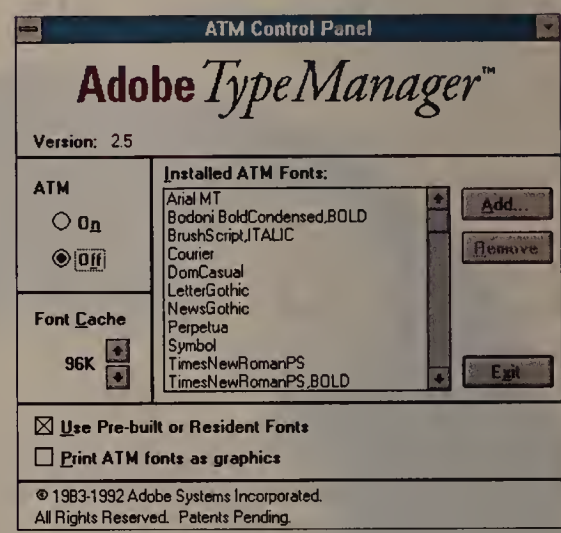


FIGURE 3: IF YOU'RE RUNNING ADOBE TYPE MANAGER, consider freeing up RAM and resources by disabling it.

If you spend most of your computing day within 1-2-3, you'll benefit from the speedy performance offered by today's video cards, particularly if you exploit 1-2-3's charting and mapping features. But your worksheets and related data probably don't need the thousands or millions of on-screen colors that most cards provide. You can usually eke out the snappiest performance from your card by choosing a driver that displays only 16 or 256 colors.

Ami Pro 3.0 and 3.1 Lotus's graphical word processor ties with Organizer 1.1 for the fewest system requirements in SmartSuite. You can perform basic Ami Pro tasks in a system with 4MB of RAM, but if you frequently open more than four documents simultaneously, or two or more large documents, you'll see a performance increase by upping your RAM to 6MB or 8MB.

If you're tight on RAM, one way to free up as much memory as possible is to reduce the number of levels of undo. Select *Tools • User Setup*, and you'll see the dialog box shown in **FIGURE 4** (on the next page). Click the *Undo levels* drop-down box and specify no more than two undo levels.

Approach 3.0 Like any database program, Approach spends a lot of time pumping information to and from the PC's hard disk, so it benefits mainly from a fast hard disk. If your PC has an older IDE drive and an ISA interface card, upgrading to new equipment that uses technologies like Enhanced IDE or SCSI-2 can do more to speed up Approach than can a faster CPU or more RAM.

No matter what type of hard disk you have, you can improve Approach's performance with a disk cache utility. The most feature-filled cache programs are third-party products such as the Norton SpeedCache and Super PC-Kwik, but both DOS and Windows come with SmartDrive, a reliable, effective cache utility. Windows for Workgroups 3.11 includes the 32-bit file access cache for even faster hard disk performance than SmartDrive provides.

A disk caching program sets aside part of system RAM as a cache; when an application requests data from the hard disk, the caching program fetches an entire track of data instead of just the requested piece, storing it all in the cache's RAM. When the application requests more hard disk data, the caching program checks to see if the needed information is in the cache. If it is, the caching program retrieves the data from the cache, avoiding the far slower process of accessing the hard drive.

Besides caching data that's read from the hard disk, most caching programs speed up Approach and other disk-intensive programs by capturing data that's on its way to the hard drive, then actually writing it during spare moments when it won't slow down your productivity. (This delayed writing carries a slight chance of data corruption if your PC crashes or loses power at an inopportune time; you can disable write caching if you don't want to take the risk.)

The more RAM you set aside for SmartDrive's cache, the more likely that data will be in the cache when it's needed. If you don't tell SmartDrive how much RAM to use, it will choose a default size.

Using the default size usually results in the best performance with Approach; regardless of how much RAM you have, performance improvements drop off quickly at cache sizes above 2MB. But if you're doing a lot of data-intensive work with large databases, you can try manually increasing the size of your cache to 3MB.

Choosing the default size for the SmartDrive disk cache program will usually result in the best performance in Approach.

Even if your PC has plenty of RAM, think twice before creating a very large cache. The RAM that SmartDrive uses becomes unavailable for running programs or opening files. In fact, if you spend most of your time in the other SmartSuite applications, you may improve overall performance by decreasing the size of your cache below the default value.

If you use Windows for Workgroups 3.11 with 32-bit file access turned on, SmartDrive's cache gets used only for floppy disk activities; the 32-bit file access feature substitutes its own hard disk cache. You can conserve RAM by disabling SmartDrive, but you'll get slower floppy performance.

For a thorough explanation of SmartDrive and how to configure it, type **help smartdrv** at the DOS prompt.

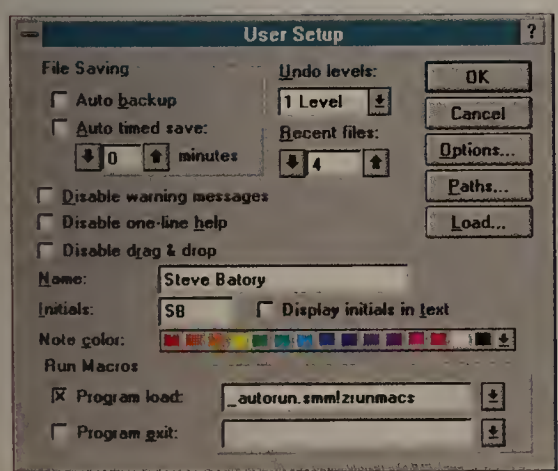


FIGURE 4: REDUCE AMI PRO'S MEMORY USE by limiting undo levels to one or two.

Freelance Graphics 2.0 and 2.1 If you use Freelance to produce simple handouts or overheads, you probably don't need to worry much about maximizing your PC's performance. But if you create elaborate screen shows full of charts and clip art, you'll benefit greatly from an accelerated VGA card.

To harness the full power of an accelerated video card under Windows, choose one of the Windows video drivers supplied by the card maker, rather than the generic drivers included in Windows. Note that drivers using lower resolutions and fewer colors provide snappier performance than those displaying millions of colors at high resolutions. Unless your screen shows include high-quality photos, you'll find that a driver using 256 colors at 640 by 480 or 800 by 600 resolution offers the best combination of speed and appealing visuals.

The hard disk optimization techniques discussed above for Approach are also helpful for Freelance, especially if you create complex shows that cause the PC to chug away at its hard drive for extended periods.

Organizer 1.1 and 2.0 If you're still using SmartSuite 3.0, you have a copy of Organizer 1.1, a personal information manager that runs well on a 386 with 4MB of RAM and needs only 4MB of hard disk space.

SmartSuite 3.1, on the other hand, comes with Organizer 2.0, a more powerful upgrade that provides potent group scheduling and other enhancements over version 1.1. But Lotus doesn't recommend running Organizer 2.0 on a 386, and the program now uses 10MB of disk space in a full, stand-alone installation. In addition, the new version creates data files that are twice as large as 1.1 files. For all these reasons, if you're a SmartSuite 3.0 user, you may want to stick with Organizer 1.1 if you're using an older PC and don't need version 2.0's group scheduling capabilities.

You can make either version of Organizer a bit more responsive by disabling the Animated Page Turn option, which shows a page-flip effect as you move through your Organizer notebook. In Organizer 1.1, select *Options • Preferences* and deselect the *Animated Page Turn* check box. In version 2.0, select *File • Organizer Preferences • Organizer Setup* and deselect the *Animated Page Turn* check box in the Display section.

Reid Goldsborough is the author of Straight Talk About the Information Superhighway *(Alpha Books, 1994; 800/428-5331).*

Add Style to Your Worksheets

Last month we saw how numeric formats can make your worksheets easier to understand and use. This month we'll explore a few more formatting options in 1-2-3—fonts, lines, boxes, and colors—that will help you emphasize key data and enhance your worksheet's overall presentation.

Try the techniques listed below on your own worksheets, or create a plain-vanilla version of the worksheet shown in **FIGURE 1** and use it as a palette. To build the worksheet, enter the label **Porter Kennel** in cell B2, enter the rest of the labels in row 5 and in column B, then enter the values in range C6..E12. Enter the formula **@sum(C6..E6)** in cell F6, and copy it to range F7..F12. Enter the formula **@sum(C6..C12)** in cell C13, and copy it to range D13..F13. Set the width of column B to **12**, and assign the *Currency 0* format to range C6..F13.

1 Make information stand out with different fonts and attributes. To assign fonts and sizes in releases 4.*x* and 5.0 for Windows, first highlight the cell or range you want to change, then choose *Style•Font & Attributes*. Scroll through the Face and Size list boxes in the resulting dialog box to choose a typeface and a point size. If you don't see the size you want, you can type a point size directly into the box above the Size list box.

The same dialog box allows you to apply attributes and colors to the fonts in a highlighted worksheet range. Click the check boxes in the Attributes section to select and deselect *Bold*, *Italics*, and *Underline*, or choose the *Normal* attribute to convert all bold, italic, and underlined type to plain. You can also select an underline style in the drop-down box below the Underline check box. To change the color of fonts in a highlighted range, click the *Color* drop-down box for a palette of available colors. When you click *OK*, 1-2-3 applies the changes that you have specified.

In release 4.0 for DOS, you can also use the status bar to change font and point size. Highlight the range, then with the mouse, click the font button on the status bar to display the current font set and make a selection.

To change a font in DOS releases 2.*x* and 3.*x*, you have to use the Wysiwyg menu. Highlight the range, select *:Format•Font*, and choose from among eight fonts in a fixed size.

In Figure 1 we assigned the Arial 24 font to the worksheet title and the bold attribute to ranges B6..B13 and C5..F5.

2 Add color, lines, borders, and patterns to your worksheets to enhance key data. In the Windows releases, you add color, patterns, lines, and frames to a range by selecting the range and choosing *Style•Lines & Color*. 1-2-3 displays the dialog box that is shown in **FIGURE 2** on the next page.

To color the worksheet title in cell B2 of Figure 1, click the *Text color* drop-down box and select a blue from the palette. To color range B2..F13 yellow, click the *Background color* drop-down box and select a pale yellow. To create the blue underline in range B12..F12, select the *Bottom* check box in the Border section, select the double underline from the *Line style* drop-down box, and select a blue from the *Line color* drop-down box.

In the DOS releases, you add lines and shading via the :Format•Lines and :Format•Shade commands. To add the line to row 12 in Figure 1, highlight range B12..F12 and select *:Format•Lines•Double•Bottom*.

Add color in DOS via the :Format•Color menu. To color the title in Figure 1, highlight cell B2, select *:Format•Color•Text*, choose *Dark-Blue* from the eight colors listed, and press **<Enter>**. Next, apply the yellow background by highlighting range B2..F13, selecting *:Format•Color•Background*, and then selecting *Yellow*.

	A	B	C	D	E	F	G
1							
2		Porter Kennel					
3							
4							
5			April	May	June	Total	
6		Board/Basic	$1,267	$1,790	$1,800	$4,857	
7		Board/Extra	$300	$350	$600	$1,250	
8		Wash	$1,050	$2,000	$1,500	$4,550	
9		Groom	$1,000	$990	$1,200	$3,190	
10		Flea Dip	$1,506	$1,492	$1,500	$4,498	
11		Nail Clipping	$600	$550	$650	$1,800	
12		Exam	$2,000	$2,600	$3,500	$8,100	
13		Total	$7,723	$9,772	$10,750	$28,245	
14							
15							

FIGURE 1: A LITTLE VARIETY IN FONTS, SIZE, AND ATTRIBUTES and a splash of color can make your worksheets more appealing.

FIGURE 2: THE LINES & COLOR dialog box offers several options for framing a range of data for an eye-catching effect.

The :Display•Colors menu lets you select colors for lines and drop shadows, but you can't change the color of individual lines or shadows—you can only change the color of *all* the lines or drop shadows in the worksheet.

3 Align worksheet titles and column heads for a more polished look. By default, 1-2-3 aligns a label against the left side of the cell it occupies. Often you'll want to change that—to center a worksheet's title on the page, for example.

In the Windows releases, highlight the cell or range you want to change, then select *Style•Alignment*. The resulting Alignment dialog box lets you specify the horizontal and vertical alignment of labels and values. In addition to the usual three choices—they're Left, Right, and Center—you can select General, which aligns labels to the left and values to the right, or Evenly Spaced, which stretches labels to span the width of the cells. (This feature does not work on labels that end with a period, an exclamation point, a question mark, or a colon.) When you're working with ranges, you can select Across Columns to align a label in the leftmost cell over all the columns within the range, according to your horizontal alignment selection. Vertical alignment choices include Top, Center, and Bottom, and the height of the cell must be larger than the largest typeface.

To center the title in cell B2 across columns B through F, in releases 4.*x* and 5.0 for Windows, highlight range B2..F2, choose *Style•Alignment*, select *Center* as the horizontal alignment, click the *Across Columns* check box, and click *OK*. To right-align the labels in row 5, highlight range C5..F5, select *Style•Alignment*, select *Right* as the horizontal alignment, and click *OK*.

The DOS releases offer similar alignment features, with a few limitations. Highlight the range you want to align, select *:Text•Align*, and choose between Right, Left, Center, or Even. ('Even' alignment is equivalent to the Windows versions' Evenly Spaced.) The DOS releases can align only labels, not values, and they don't let you control vertical alignment.

4 Save time by copying formats. You don't have to reinvent the wheel every time you enter new data into your worksheet. After you've found a combination of formatting elements that you like, apply them to other data in the worksheet by copying them, rather than by re-creating them from scratch.

In release 4.*x* for Windows, use the *Edit•Copy* command to copy the cell with the desired formatting to the Windows Clipboard. Next, select the cell or range you want to apply that formatting to, select *Edit•Paste Special*, click the *Styles only* button in the resulting dialog box, and then click *OK*.

In the DOS releases of 1-2-3, use *:Special•Copy* to copy all Wysiwyg styles and formatting from one worksheet range to another.

Remember that when you elect to copy formats from one cell to another, 1-2-3 copies all the style elements that were applied to the first cell. These include text attributes, frames, lines, colors, patterns or shading, typeface, and type size. In Windows releases 4.*x* and 5.0, the alignment and numeric formats are copied as well.

5 Take advantage of 1-2-3's predefined styles. Windows releases 4.*x* and 5.0 and DOS release 4.0 come with predefined styles that are handy options if you don't have enough design skills (or enough time) to compose an attractive worksheet on your own.

The Windows releases supply you with 14 style templates (see **FIGURE 3**). To use one, select the range you want to apply it to and choose *Style•Gallery*. As you highlight the template names, 1-2-3's Sample box displays an example of what the range will look like. When you find a template you like, just click *OK*.

In release 4.0 for DOS, you can choose from six predefined named styles either by selecting *:Named-Style* from the menu or, if you want to use the mouse, by clicking the named-style button on the status bar and selecting a style from the pop-up menu. (To get a description of each style, just highlight the Named-Style menu choice. The description appears below it.)

While it's tempting to change 1-2-3's formatting options with reckless abandon, your worksheets will look more professional if you use restraint. But don't be afraid to experiment; you can remove whatever formatting you've applied in Windows by selecting *Edit•Clear*, then choosing *Styles only* and clicking *OK*. In DOS, select *:Format•Reset* to clear format information.

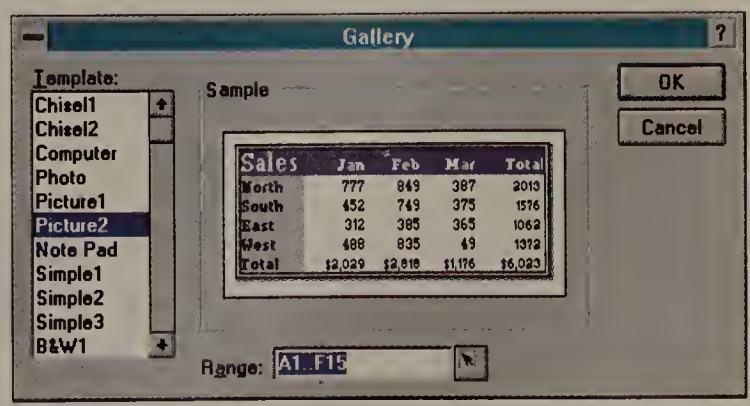


FIGURE 3: GIVE ANY WORKSHEET INSTANT VISUAL IMPACT with one of 14 predefined styles in Windows.

By Cynthia G. Fitzgerald

Cynthia G. Fitzgerald is a freelance writer in Natick, Massachusetts.

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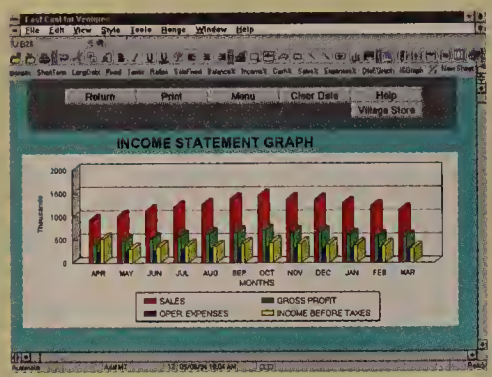

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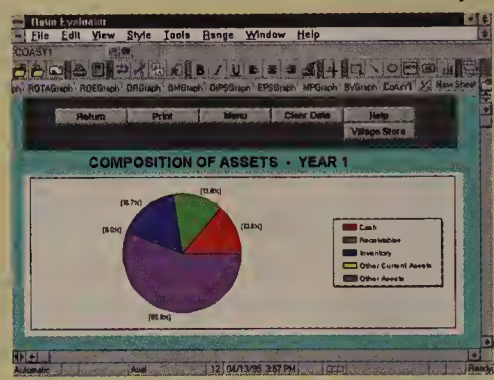

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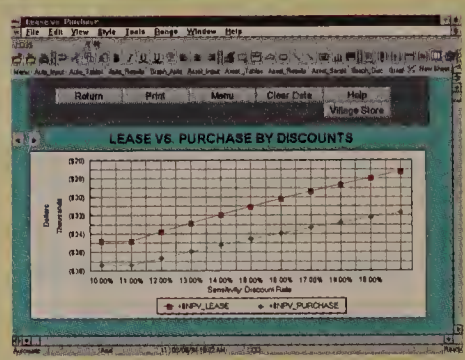

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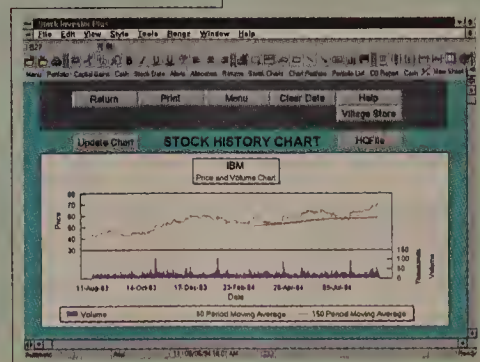

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Pull Text Strings in the Worksheet

You know how to write a formula that calculates 2+2, but can you create a formula that puts the words *two* and *two* together? Formulas that manipulate text strings aren't as esoteric as they may seem, and once you get the hang of them, you'll find them plenty handy.

You might, for example, use a string formula to pull names and addresses from a customer database and format them as mailing labels. If each customer's first and last names are in one cell, you can create a string formula to divide the names into separate cells for easier sorting. You can even create a conditional formula that returns a message if a customer's account is past due.

1-2-3 provides special operators and @functions for all these cases. Here are ten tips to help you write formulas that manipulate text.

1 Combine a formula result with text. The simplest formulas concatenate two labels using the ampersand (&) operator. To combine the result of a numeric formula with a label, add an @string function to convert the result to a label.

	A	B	C	D
1		2nd Quarter		
2	April	May	June	
3	85	65	55	
4	25	65	30	
5	35	70	40	
6	145	200	125	
7				
8	470 units were sold during the second quarter.			
9				

FIGURE 1: COMBINE A VALUE WITH TEXT by first converting it into a label with the @string function.

In **FIGURE 1**, cells A6, B6, and C6 contain @sum formulas that total the values in each column, and cell A8 contains the formula **@string(@sum(A6..C6),0) &" units were sold during the second quarter."**.

If you change any of the values in range A3..C5, the formula in cell A8 automatically displays the new result.

2 Combine a date with text. To combine text with a date, use the @day, @month, and @year functions to extract numbers from the date serial number, and the @string function to change each number into a label.

For example, to create a formula that combines "Today's date is" with the date, enter **@today** in cell A1, then enter the following formula in any blank cell:

+"Today's date is "&@string(@month(A1),0) &"/"&@string(@day(A1),0)&"/"&@string (@year(A1),0)&"."

If you don't want to enter the date in a separate cell, replace each 'A1' with **@today**.

3 Divide a long label into separate cells. Say you've downloaded a list of names and addresses into 1-2-3, and you now have a worksheet like the one in **FIGURE 2**. To divide the cities, states, and zip codes into separate cells, use the @left, @right, and @mid functions. @left extracts characters from the beginning of a text string, @right from the end, and @mid from the middle. Use the @find function to identify the comma and @length to find the number of characters in the string.

To divide the labels in column C, enter the following formulas and then copy them down the column. The formula in cell D1 returns the city, cell E1 returns the state, and cell F1 returns the five- or nine-digit zip code.

CELL	FORMULA
D1	**@left(C1,@find(",",C1,0))**
E1	**@mid(C1,@find(",",C1,0)+2,2)**
F1	**@right(C1,@length(C1)-@find (",",C1,0)-5)**

In the Windows releases, highlight the formulas in columns D through F and select *Edit•Copy*. Move the pointer to cell C1, select *Edit•Paste Special*, then *Formulas as values*, and click *OK*. In DOS, select */Range•Value;* indicate the formulas in columns D through F as the range to copy from and cell C1 as the range to copy to. Finally, in all releases, delete the data in column F.

Use the same technique to divide first and last names into separate cells.

4 Extract part of a string. You've separated the cities, states, and zip codes into different columns, but now you want to make one more adjustment to the downloaded data and remove the title that precedes every name. You can take out just the name from the cell using the formula **@mid(A1,@find(" ",A1,0)+1,240)** without having to extract each of the titles manually.

	A	B	C
1	Miss Joanna Roush	28 Clearwater St.	Boston, MA 02115
2	Mrs. Katrin Rapp	3 Zinna Bloom Rd	Newton, MA 02162
3	Dr. Peter Ferlisi	23 Kings Place	Raleigh, NC 49823-3242
4	Atty. Amber Boggs	498 Brushy Lane	Charlotte, NC 45644

FIGURE 2: DIVIDE A LONG LABEL INTO SEPARATE CELLS using @left, @right, and @mid formulas.

5 Rearrange a name. Here's an easy way to change the order of a name from *Last name, First name* to *First name Last name*. In the worksheet in **FIGURE 3**, we first entered the following formula in cell B1 and then copied it into the range B2..B3: **@mid(A1,@find(",",A1,0)+2,60)&" "& @left(A1,@find(",",A1,0))**

6 Right-align a label formula. You've created a template that has the name of the month right-aligned in cell A1, and you want to copy that label to several other cells in the worksheet. To copy the label that's currently in cell A1 into cell H1, in the Windows releases enter the following into cell H1: **@repeat(" ",@cell ("width",H2)-@length(A1))&A1**

In the DOS releases, insert a **1** after @cell("width",H2)–.

	A	B
1	Brickett, John	John Brickett
2	Jupiter, Amy	Amy Jupiter
3	Stallman, Lucy	Lucy Stallman

FIGURE 3: PUT FIRST NAMES FIRST with a formula that combines the @mid, @left, and @find functions.

Here's how the formula works: The @cell("width") function determines the width of the current column, and the @length function determines the length of the label in cell A1. The @repeat function duplicates the appropriate number of blank spaces to right-align the label. Finally, the ampersand concatenates the blank spaces with the label in cell A1.

You must assign a monospaced font to the labels, or this formula won't work. Monospaced font characters each use the same amount of space, while proportional font characters use different amounts of space. For example, the letter *m* takes more space than an *l*.

In release 5.0 for Windows, use the @setstring(*text*;*length*;[*alignment*]) function instead. @setstring returns a label that's *length* characters long, composed of *text* and enough blank spaces to align *text* as specified by *alignment*. The alignment argument is optional; if you omit it, *text* is aligned to the left of the extra spaces in *length*.

The formula should read:

@setstring(A1,@cell("width",H2),2)

Assign a monospaced font to the labels you want to copy.

7 Convert dates into a recognizable format. If you've downloaded data from another program into 1-2-3, and all the dates are in the *mm-dd-yy* format, you'll have to change them to the *mm/dd/yy* format using the functions @mid and @replace. Then you'll have to use the @datevalue function to convert the date labels into date numbers so that they can be used in calculations.

If the labels you want to convert begin in cell A1, enter the following in cell B1 and copy it down the column:

@datevalue(@replace(A1,2,4,"/"&
@mid(A1,3,2)&"/"))

Then use the *Edit•Copy* and *Edit•Paste Special* commands (*/Range•Value* in DOS) to convert the formulas in column B to their values. Specify the formulas in column B as the range to copy from and cell A1 as the range to copy to. Then erase the data in column B. Finally, assign a date format to the date serial numbers in column A.

8 Re-create named ranges. When you combine a worksheet file on disk with the current worksheet (by using the File•Open•Combine command in the Windows releases or the /File•Combine command in the DOS releases), 1-2-3 doesn't combine the range names. Instead of manually reassigning the range names, use string concatenation to create a macro that automates the task.

	X	Y	Z	AA
1	COSTS	A12..D18	/RNCCOSTS~A12..D18~	
2	PROFITS	A20..D20	/RNCPROFITS~A20..D20~	
3	QTR1	A1..A20	/RNCQTR1~A1..A20~	
4	QTR2	B1..B20	/RNCQTR2~B1..B20~	
5	QTR3	C1..C20	/RNCQTR3~C1..C20~	
6	QTR4	D1..D20	/RNCQTR4~D1..D20~	
7	SALES	A2..D10	/RNCSALES~A2..D10~	

FIGURE 4: USE STRING CONCATENATION TO CREATE A MACRO that helps you quickly reassign range names.

First, create a table of range names and their addresses in the original worksheet. In the Windows releases, select *Range•Name•Table*. In the DOS releases, select */Range•Name•Table*.

In **FIGURE 4**, the table is in columns X and Y. The range names begin in cell X1, and the addresses begin in cell Y1. Enter the formula **+"/RNC"&X1&"~"&Y1&"~"** in cell Z1, and copy it down the column.

Use the *Edit•Copy* and *Edit•Paste Special* commands (*/Range•Value* in the DOS releases) to convert the formulas in column Z to labels. Assign a name to cell Z1. Finally, run the macro. The macro assigns each range name that appears in column X to the range listed in the adjacent cell of column Y.

9 Change labels into values. You've downloaded stock quotes into 1-2-3 but the quotes are labels. Use the @value function to make them values.

If the stock quotes are in column B, enter the formula **@value(B1)** in cell C1 and copy it down the column. Then use *Edit•Copy* and *Edit•Paste Special* (*/Range•Value* in the DOS releases) to convert them to values.

10 Return different labels under varying conditions. This formula returns 'Needs attention!' as a red, underlined label if @sum(A2..A5) is less than 1200:

@if(@sum(A2..A5)<1200,"|1_|
2cNeeds attention!|","|b|
4cNice work!|")

If the result is 1200 or more, the formula returns the label 'Nice work!' in blue (see **FIGURE 5**).

	A
1	Sales
2	$135
3	$100
4	$275
5	$775
6	$1,285
7	
8	Nice work!

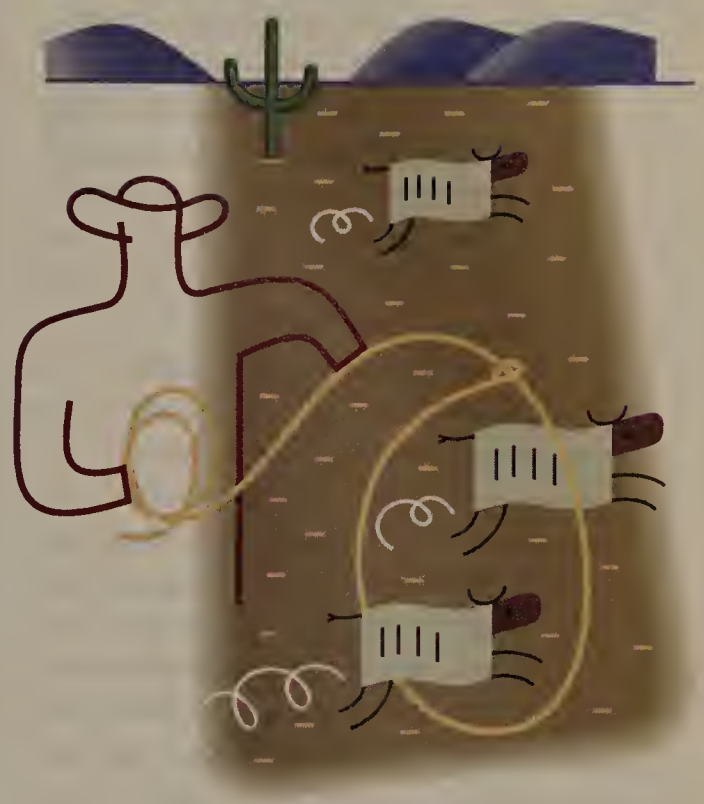
FIGURE 5: TEXT ARGUMENTS IN A CONDITIONAL FORMULA let you match the message with the result.

In 1-2-3 for Windows, press **<Alt>-<F1>** and type **ba** to create the begin-attribute symbol. Press **<Alt>-<F1>** and type **ea** to create the end-attribute symbol. 1-2-3 displays the symbols as solid vertical bars. In the DOS releases, press **<Ctrl>-A** to create the begin-attribute symbol (an upward-pointing arrow) and **<Ctrl>-N** to create the end-attribute symbol (a downward-pointing arrow). Check the Wysiwyg documentation for a complete listing of all the formatting sequences.

By Carol White

Carol White is an associate editor for PC World Lotus Edition.

Specify Several Print Ranges at Once



Print Several Ranges at One Time

Q Is there a trick to printing a multi-sheet file? If I specify the entire file as the print range, the sheets don't end up on separate pages. Instead, I have to specify the first sheet as a print range, print, redefine the range to print the second sheet, and so on. Can I print all the sheets in one operation and have them appear on separate pages?
Steve Murphy, Goffstown, New Hampshire

A You specify several print ranges at once by separating their addresses with semicolons—as in A:A1..A:H20; B:A1..B:H20;D:A1..D:H20. If you want the ranges to appear on separate pages, include a page break in the last row of each print range.

In all releases that support 3-D files, you can specify the print range by typing it. In 4.0 for DOS and the Windows releases, you can specify print ranges with the mouse. Just type a semicolon after you highlight each range.

In releases 4.*x* and 5.0 for Windows, you can also preselect multiple print ranges with the mouse. After you highlight the first range, hold down the **<Ctrl>** key and highlight each additional range. 1-2-3 automatically separates the range addresses with semicolons.

Unless you've added page breaks, 1-2-3 prints the ranges directly below one another. To print them on separate sheets, add a page break to the last row of each print range to advance the paper between ranges.

An Edit Line of a Different Color

Q Can I change the color of the edit line in 1-2-3 release 4.*x* for Windows? The gray makes my eyes tired.
Susan Krieger, Warwick, Massachusetts

A Yes, you can change the color of the edit line to white. But doing so will also change the background color of most dialog boxes to white, which may make them harder to read.

To change the color, you have to edit 1-2-3's .ini file in the windows subdirectory, the file where many of the worksheet's default settings are stored.

First make sure 1-2-3 is not loaded. Then, in the Windows Program Manager, select *File•Run* and enter **123R4.ini** to open the Notepad accessory and call 1-2-3's .ini file. Press **<Page Down>** until you see the section 'Great_looking_dialogs'. Change 'great_looking_dialogs =2' to **great_looking_dialogs=0**.

Select *File•Save* and close Notepad. Start 1-2-3; the edit line is white.

Cells That Run in Circles

Q I am having a problem with a worksheet that calculates running balances. The calculations are creating circular references. How is it possible to avoid such references when you're calculating running balances?
David Samuel, Flushing, New York

A A circular formula refers directly or indirectly to itself. The formula +A2+B2 entered into cell B2, for example, contains a circular reference because it is attempting to use its own contents in the calculation.

To create a running total in your own worksheet, review the one shown in the worksheet below, a mortgage amortization that calculates cumulative principal and interest in columns E and F.

To try this out, enter the labels in the figure. Then assign the labels in range A1..A3 as names for the adjacent cells in column B. Enter the values in range B1..B3, and enter the formula **@pmt(principal,interest/12,term*12)** in cell B4.

Then enter the following formulas:

CELL	FORMULA
A10	**+principal**
A11	**+G10**
B10	**+B$4**
C10	**+B10−D10**
D10	**+A10*(B$2/12)**
E10	**+C10**
E11	**+E10+C11**
G10	**+A10−C10**

Copy cell A11 to range A12..A21. Copy

	A	B	C	D	E	F	G
1	Principal	$100,000					
2	Interest	9.50%					
3	Term	30					
4	Monthly Payment	$840.85					
5							
6							
7	First 12 Months of Payments on a 30-Year Loan						
8	Beginning				Cumulative	Cumulative	Ending
9	Balance	Payments	Principal	Interest	Principal	Interest	Balance
10	$100,000.00	$840.85	$49.19	$791.67	$49.19	$791.67	$99,950.81
11	99,950.81	840.85	49.58	791.28	98.76	1,582.94	99,901.24
12	99,901.24	840.85	49.97	790.88	148.73	2,373.83	99,851.27
13	99,851.27	840.85	50.37	790.49	199.10	3,164.32	99,800.90
14	99,800.90	840.85	50.76	790.09	249.86	3,954.41	99,750.14
15	99,750.14	840.85	51.17	789.69	301.03	4,744.10	99,698.97
16	99,698.97	840.85	51.57	789.28	352.60	5,533.38	99,647.40
17	99,647.40	840.85	51.98	788.88	404.58	6,322.26	99,595.42
18	99,595.42	840.85	52.39	788.46	456.97	7,110.72	99,543.03
19	99,543.03	840.85	52.81	788.05	509.77	7,898.77	99,490.23
20	99,490.23	840.85	53.22	787.63	563.00	8,686.40	99,437.00
21	99,437.00	840.85	53.64	787.21	616.64	9,473.61	99,383.36

range B10..D10 to range B11.B21. Copy cell E10 to cell F10. Copy cell E11 to range E11..F21. Finally, copy cell G10 to range G11..G21.

Assign *Comma 2* as the default format. Assign the *Currency 0* format to cell B1, the *Percent 2* format to cell B2, and the *Fixed 0* format to cell B3. Assign the *Currency 2* format to cell B4 and range A10..G10.

As you can see, the formulas in columns E and F return cumulative, or running, totals without a Circ error.

If you still need to locate a formula with a circular reference, in releases 4.*x* and 5.0 for Windows click the *Circ* button on the status bar. 1-2-3 moves the pointer to one of the cells that contain a circular reference, letting you fix that formula. If your file has more than one circular reference, you'll have to repeat this procedure for each one.

In DOS releases 2.*x*, 3.*x*, and 4.0, select */Worksheet•Status*. 1-2-3 displays the address of one of the cells with a circular reference. Again, if the Circ indicator still appears after you've fixed the formula, repeat the process.

To find all the circular references in a worksheet at once, you can use 1-2-3's Auditor. This is a built-in feature of Windows releases 4.*x* and 5.0 and an add-in for DOS releases 2.3, 2.4, 3.1+, 3.4, and 4.0. In the Windows releases, select *Tools•Audit*, select the *Circular references* and *Report at range* buttons in the Audit dialog box, and click the Range button to select a range for the Auditor's report. Select a cell in a blank area, and click *OK*. 1-2-3 displays a dialog box with a list of all the cells that contain circular references. When you highlight one of these cells and click *OK*, 1-2-3 displays a three-line report.

To load the Auditor in release 2.*x*, select */Add-In•Attach*, choose the file *auditor.adn*, and select *No-Key*.

In releases 3.*x* and 4.0 for DOS, press **<Alt>-<F10>**, select *Load*, choose the file *auditor.plc*, and select *No-Key*. In all DOS releases, select *Invoke•Auditor*. A menu appears.

Select *Options•List*, select *Quit* to return to the main Auditor menu, and choose *Circs*. Auditor asks you where you want to place the list of circular references. Select a cell in a blank area of your worksheet. Auditor displays a list of all the cells that contain circular references. Select one of the cell addresses, press **<Enter>**, and select *Quit* to get a complete report.

	A	B	C	D	E	F	G	H	I
1									
2				Truck No.					
3	Days	T10	T11	T13	T15	T16	T20	T21	T23
4	1	IS	OS	IS	SB	OS	OS	SB	IS
5	2	OS	IS	SB	SB	OS	IS	IS	SB
6	3	SB	OS	OS	OS	IS	IS	IS	OS
7	4	IS	IS	IS	OS	OS	SB	SB	OS
8									
9									
10									
11		Criteria			4 IS	OS	SB		
12		T10		T10		2	1	1	
13				T11		2	2	0	
14				T13		2	1	1	
15				T15		0	2	2	
16				T16		1	3	0	
17				T20		2	1	1	
18				T21		2	0	2	
19				T23		1	2	1	

	A	B	C	D	E
1			June 1995		
2			Days of the Month		
3	Truck No.	1	2	3	4
4	10	IS	OS	SB	IS
5	11	OS	IS	OS	IS
6	13	IS	SB	OS	IS
7	15	SB	SB	OS	OS
8	16	OS	OS	IS	OS
9	20	OS	IS	IS	SB
10	21	SB	IS	IS	SB
11	23	IS	SB	OS	OS

Keep Tabs on Your Trucks

Q I keep track of the status of trucks in our city's Street Maintenance Division by entering codes into a worksheet, like the one in the figure at left. Each day, I enter a status code for each truck: OS if the truck is out of service, IS if it's in service, and SB if it's on standby. How do I count the number of days each truck has held each status?

Wayne D. Springer,
Kettering, Ohio

A The Range•Analyze•What-if Table command in the Windows releases of 1-2-3 and the /Data•Table•2 command in the DOS releases will give the results you need.

But first you must remedy a basic problem in your worksheet. The query you want to make is, "For every value of the Truck field, how many other fields have the same value?" However, 1-2-3's database-query features do not provide for this kind of question.

However, if you transpose the database as shown in the upper part of the figure above, then the Days of the Month fields (1, 2, 3, and so on) become values of a Days field, and the truck numbers, now values of the Truck No. field, are relabeled to become separate fields. With this conversion you can make the query, "In how many records does the T*n* field have the value OS?" Setting up a database table lets you make such a query for each field in one operation.

Transpose your data by selecting *Range•Transpose* in 1-2-3 for Windows or */Range•Transpose* in 1-2-3 for DOS. Specify range A3..E11 as the range to transpose, and specify the upper left corner of a blank area that can accommodate your data as the To range. (In this example, the To range is B:A3.) Now your data appears as in the figure.

1-2-3 also requires that your field names be labels. Edit the cells containing the truck numbers in row 3 so they appear in a form 1-2-3 will recognize as a label (for example, T10, T11, and so on). In the future, enter your data using labels for truck numbers and this transposed form for your data.

Now you are ready to let 1-2-3 do some calculating. Enter the labels that appear in ranges A3, D2, B11, and E11..G11. Again, use the *Range•Transpose* command, this time to transpose

range B3..I3 to cell D12. Enter the formula **@dcount(A3..I7,B12,B12..B13)** in cell D11. This formula will work with the data table command to return the type of data you are looking for. In this case we use the @dcount formula because we want to count the number of times a truck had a specific status.

The formula in cell D11 refers to two input cells. Each value that appears in the first column of the table will be plugged into input cell 1, and each value that appears in the top row of the table will be plugged into input cell 2. Then 1-2-3 will calculate the formula with each pair of values and copy the result into the table.

This happens so fast, you don't see 1-2-3 copying the values to the criteria range, calculating the formula, then copying the result to the table.

Select *Range•Analyze•What-if Table* in 1-2-3 for Windows. Make sure the Number of variables box displays 2. In 1-2-3 for DOS, select */Data•Table•2.*

In all releases, specify the table range as D11..G19, input cell 1 as B12, and input cell 2 as B13. In Windows releases 4.*x* and 5.0, click *OK.*

Your data table returns the IS, OS, and SB numbers for each truck, as in the bottom of the second worksheet.

Make Automatic Copies

Q I use the model featured in "Managing Your Mortgage" [May 1994]

GOOD IDEAS

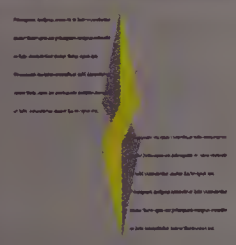
Safeguard Templates

It takes too much time to safeguard a worksheet by enabling global protection and then unprotecting individual cells. Here's what I do instead.

After creating a template in 1-2-3 release 2.2, I save the worksheet with a **.wkt** extension, then select */File•Save* again. 1-2-3 displays the file name with a .wk1 extension in the control panel, along with the message 'File will be saved as .WK1'. I press **<Enter>**, and 1-2-3 saves a copy of the file to disk with a .wk1 extension. Now I have a template file with a .wkt extension, and a working copy of the file with a .wk1 extension.

If I have to make a change to the template file, I make sure to specify the complete file name, as well as the .wkt extension, when I retrieve and save the file.
Larry L. Bolt, Fort Collins, Colorado

Editor's note: Keep in mind that 1-2-3 release 3.*x* and 1-2-3 for Windows automatically save the file with the existing extension, even if it's not the default extension. This means you'll have to specify the .wk3 or .wk4 extension when you create the working copy of the file.



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Circle 1 on reader service card

to keep track of a mortgage I am financing, but I want to make one modification to the model. As I receive payments, I want 1-2-3 to automatically copy the interest paid to one file (income.wk4) and copy the remaining balance to another file (worth.wk4). How do I get 1-2-3 to do this?
Percy F. Richards, Jr.,
Gretna, Louisiana

A You can create formulas that automatically return the last interest and balance values. Enter the formulas in a separate area of the original mortgage worksheet and use these cells in file-linking formulas.

Here's how: Enter **Int** in cell G1, and enter **Bal** in cell H1. To find the last interest value, enter **@index(C18..C377,0,@count(C18..C377)-1)** in cell G2. To find the last balance, enter **@index(F17..F377,0,@count(F17..F377)-1)** in cell H2. When you record a payment, the formulas return the last interest and balance from columns C and F. If these ranges contain blank cells, the formula returns incorrect results.

Assign the name **Int** to cell G2 and the name **Bal** to cell H2. Save the file. Then use these range names in linking formulas. For example, if the file is named mort.wk4, the linking formulas **+«mort.wk4»Int** and **+<<mort.wk4>>bal**, entered into another file, will return the latest interest and balance.

If you're working in DOS release 3.*x* or 4.0 or in Windows, instead of entering the @index formulas in the original mortgage file, enter them right in the linking formulas. For example, to create a file-linking formula that returns the latest interest value from mort.wk3, enter **@index(«mort.wk3»C18..C377,0,@count(«mort.wk3»C18..C377)-1).** To create the formula that returns the latest balance, enter **@index(«mort.wk3»F17..F377,0,@count(«mort.wk3»F17..F377)-1.**

Release Sticky Tabs

Q I renamed all the worksheet tabs in a release 4.01 file, and now I want to change them back to the original letters. I've tried pressing <Backspace> and <Delete>, typing the letter, and pressing <Enter>, but it doesn't work. There must be a way to change these.
Lisa Linton, San Diego

A There is, but it's not very intuitive. Double-click the tab, press **<Backspace>** or **<Delete>**, and press **<Enter>**. The original tab letter reappears.

Do you have a question about Lotus products or a favorite technique? Send a letter including your address and daytime telephone number to *Q&A/Good Ideas, PC World Lotus Edition,* 77 Franklin St. #300, Boston, MA 02110. We will send you $60 if we publish it. Sorry, we cannot acknowledge any unpublished materials. ■

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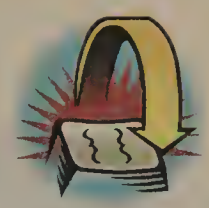


In the DOS releases of 1-2-3, the menu bar is written in stone. You can create a menu to guide users through a macro, but your menu doesn't replace the 1-2-3 menu. So a user can press the slash key in the middle of a routine and easily derail your macro.

A set of commands in releases 4.*x* and 5.0 for Windows gives you more control over your macros by letting you add commands to the 1-2-3 menu or replace it with your own menu. Here, we'll consider just one of those commands, {MENU-CREATE}.

Unlike the {MENUBRANCH} and {MENUCALL} commands, which work only within a macro, controlling which set of routines are branched to or called, {MENU-CREATE} modifies the 1-2-3 environment. As you'll see, a macro can consist of nothing *but* a {MENU-CREATE} command. The menu it displays becomes a system for invoking several individual macros.

Setting Up a Model

To illustrate {MENU-CREATE}, we'll build part of an order processing system for a small mail-order company. Our model contains macros that create, modify, and delete listings in a client database; create or modify listings describing merchandise orders; and mark items as shipped to the customer, or mark an entire order as complete (all items shipped).

Our menu, then, includes the commands Client, Order, and Process. It also includes a File command. This is important, because most Windows users look for that command to close the current file. The File menu includes a Close option that resets the menu before closing the file. Without the File command, a user might close the file by double-clicking the control menu. That would leave the now defunct custom menu in place.

For this exercise, we'll create just the client database and its macros. To create the model, start in a new file. Double-click the worksheet tab, name it **Clients**, enter the labels in **FIGURE 1**, then assign the name **clients** to range A1..E1.

Click *New Sheet*, then change sheet B's tab to **Macros**. Enter the labels in **FIGURE 2**, then select range A1..A11, select *Range•Name*, and click the *Use Labels* button. Click the arrow button next to the Range box and select B18..F18. When the dialog box returns, click *For Cells*, select *Below*, and click *Use Labels*. Click the arrow button again and select range B19..F19. Type **newdata** in the Name edit box, click *Add*, and click *OK*.

Enter the following in cell B19:

@IF(@ROWS(clients)=1,1,@DMAX(clients, "clientnum")+1)

Enter the labels shown in **FIGURE 3**, then enter the following in cell B41:

@IF(B44..B44,"{DATABASE-DELETE clients;" "Clientnum="&@STRING(@INDEX(Clients: A1..Clients:E3,0,B27.. B27),0)&"""}","{QUIT}")

Highlight A21..A52, choose *Range•Name*, click *Use Labels*, and click *OK*.

Laying Out the Menu

Now we're ready to cook up a menu to run these macros. Click *New Sheet*, and change sheet C's tab to **Menu Descr**, to denote the menu description range.

The first part of a menu description range is a list of the commands that you want to appear in the main menu, entered in contiguous cells in one row. Enter the label **menubar** in cell A1, then enter the commands in range B1..E1 of **FIGURE 4**. The ampersand (&) makes the letter that follows it appear underlined in the menu, and the underlined letter is the command's hot key. This lets you open the File drop-down menu by pressing <Alt>-F or by clicking the File option in the custom menu.

	A	B	C	D	E
1	ClientNum	Last	First	Address	City/State/Zip

FIGURE 1: ENTER THE FIELD NAMES for the client database you'll create via a custom menu.

The next step is to enter a description below each command:

CELL	LABEL
B2	**Save data, close this menu or worksheet**
C2	**Maintain list of clients**
D2	**Manage orders**
E2	**Manage fulfillment of orders**

In the third row of the description range, you can enter expressions that cause 1-2-3 to dim out menu options. If the cell two rows below an option con-

B	A	B	C	D	E	F
1	\o	{MENU-CREATE menubar}				
2						
3	savefile	{FILE-SAVE}				
4						
5	regmenu	{MENU-RESET}				
6						
7	closefile	{MENU-RESET}{FILE-CLOSE}				
8						
9	quit123	{FILE-EXIT}				
10						
11	newclient	{RECALC newnum}				
12		{GET-LABEL "Last Name";data1}				
13		{GET-LABEL "First Name";data2}				
14		{GET-LABEL "Address";data3}				
15		{GET-LABEL "City/State/Zip";data4}				
16		{APPENDBELOW clients;newdata}				
17						
18		newnum	data1	data2	data3	data4
19		1				

FIGURE 2: THE ONE-LINE MACRO IN CELL B1 replaces the 1-2-3 menu with a custom menu. The commands in range B3..B19 enable the first two options in the custom menu.

tains an expression that returns NA when the custom menu is invoked, the option will be dimmed (unselectable). You can write macros that make menu commands available only at certain times or under certain conditions. The trick is to have the macro put an NA in the appropriate cell *and* reissue the {MENU-CREATE} command. For now, leave the third row empty.

The fourth row contains the starting addresses of description ranges for the drop-down menus invoked by each menu bar command. Enter the labels shown in row 4 of Figure 4.

To create the drop-down menu for the File command, enter the labels in cells A7, B7, C7, and E7, then enter an apostrophe and a hyphen ('-) in cell D7. The hyphen creates a dividing line in the drop-down menu.

As in the main menu description range, you enter descriptions of drop-down options below each option:

CELL	LABEL
B8	**Save the data**
C8	**Restore 1-2-3 menu but keep file open**
D8	**(leave empty)**
E8	**Restore 1-2-3 menu and close this file**

As in the main description range, you can use the next row to dim a drop-down menu option. For now, leave that third row empty.

You must always leave the fourth row of a drop-down menu description range blank. It's just a Lotus quirk.

The macros that are triggered when a user clicks an option in a drop-down menu begin in the fifth row. For this exercise, we'll include just one command—a call to routines located elsewhere—in each cell of the fifth row. Enter the labels in range B11..E11 of Figure 4. (We'll create the subroutines these refer to in a moment.)

```
B    A          B          C          D          E          F          G          H          I          J
20
21  chgclient {GET-NUMBER "Enter client number";chgnum}
22            {LET chgnum;@MATCH(chgnum,clients,0)}
23            {CHOOSE-ITEM fieldlist;chgfield;"Which field do you wish to change?"}
24            {GET-LABEL "Enter new data";newfield;@INDEX(clients,chgfield+1,chgnum)}
25            {PUT clients;chgfield+1;chgnum;newfield}
26
27  chgnum
28  chgfield
29  newfield
30
31  fieldlist  Last
32             First
33             Addr
34             City
35
36  delclient {GET-NUMBER "Enter client number";chgnum}
37            {LET chgnum;@MATCH(chgnum,clients,0)}
38            {LET deletename;@INDEX(clients,2,chgnum)&" "&@INDEX(clients,1,chgnum)}
39            {BLANK confirm}{ALERT +"This deletes record for "&deletename;2;"stop";confirm}
40            {RECALC killrecord}
41  killrecord{QUIT}
42
43  deletename
44  confirm
45
46  neworder
47
48  chgorder
49
50  markship
51
52  markall
```

FIGURE 3: THESE MACROS ENABLE the remaining two options in the custom Client menu.

To create the remaining menus, first enter the following labels:

CELL	LABEL
B14	**Create a listing for a new client**
C14	**Change data on an existing client**
D14	**Delete a client listing**
B20	**Create a new order**
C20	**Change an existing order**
B26	**Mark items within an order shipped**
C26	**Mark an entire order complete**

Then enter the labels in rows 13, 17, 19, 23, 25, and 29 of Figure 4. Select range A1..A25, choose *Range•Name*, click *Use Labels*, and click *OK*.

Displaying the Menu

To run the macro that displays your menu, press **<Ctrl>-0**. The menu in **FIGURE 5** replaces 1-2-3's menu. Click the *File* option, and a three-option menu drops down. Try navigating the menu with the keyboard; it functions just like the 1-2-3 menu does.

Select *Client•New*, then respond to the four prompts. Your database now has its first record. Select *Client•New* again and add a second record; then choose *Client•Edit*. When prompted, enter one of the client numbers, select a field to edit, and enter new data to replace the old. Now try using *Client•Delete* to delete a record.

When you select *File•Restore Menu*; the 1-2-3 menu returns. Press **<Ctrl>-0** to redisplay the custom menu. If you choose *File•Save*, the macro saves the file, and the custom menu remains. If you select *File•Close*, the macro restores 1-2-3's menu, then invokes the {FILE-CLOSE} command.

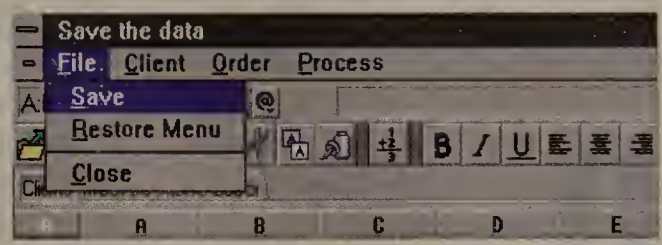


FIGURE 5: HERE'S HOW THE CUSTOM MENU looks with the File drop-down menu opened.

By Richard Cranford

PC WORLD online *The files from this article are available through PC World Online on America Online and CompuServe. Richard Cranford is a senior associate editor for* PC World *and editor of the* 1-2-3 for Windows Report.

```
 C        A              B            C            D              E            F      G      H
 1   menubar        &File        &Client      &Order       &Process
 2                  Save data, clMaintain list Manage ordersManage fulfillment of orders
 3
 4                  fileoptions   clientoptions orderoptions processoptions
 5
 6
 7   fileoptions    &Save        &Restore Menu  -           &Close
 8                   Save the dataRestore 1-2-3 menu but keepRestore 1-2-3 menu and close this file
 9
10
11                 {savefile}    {regmenu}                  {closefile}
12
13   clientoptions &New         &Edit         &Delete
14                 Create a listChange data on Delete a client listing
15
16
17                 {newclient}   {chgclient}   {delclient}
18
19   orderoptions  &New          &Change
20                 Create a new oChange an existing order
21
22
23                 {neworder}    {chgorder}
24
25   processoptions&Mark Shipped Mark &Complete
26                  Mark items witMark an entire order complete
27
28
29                 {markship}     {markall}
```

FIGURE 4: A MENU'S DESCRIPTION RANGE includes the commands you want to appear in the main menu and drop-down menus, as well as descriptions of those commands.

Make Notes Remotely Possible

One of Notes' strong suits is its open-door policy toward remote users. Its sophisticated replication technology lets you take part in Notes discussions halfway around the globe. But like travelers in a foreign land, you must speak the language and learn the customs to be accepted. Until you master the host of arcane details necessary to connect remotely, Notes is unforgiving.

To help you become fluent in remote Notes, we've collected a set of the most common problems you'll encounter and tips on how to avoid them.

1 Become the captain of your remote databases. Picture this: You're sitting in a crucial sales meeting. After pitching the account, you need to tap into a Notes database back at the office to find out when the products will be available. Armed with Notes remote on your notebook PC, you're all set. Wrong! 'Unable to replicate' or something similar appears on your screen. What do you do?

The solution to this common (and easily solved) problem lies in the local database's Access Control List.

The Access Control List specifies who has what rights to a database. For example, with Manager access, you are able to perform all actions, such as reading, writing, designing, and even deleting the database. If you've been assigned Depositor access, you're only allowed to compose new documents.

To ensure replication between your remote PC and the Notes server, you need to assign access rights for the server. To do so, select the local copy of the database and choose *File•Database•Access Control.* In the Database Access Control List, shown in **FIGURE 1**, enter the name of the server in the text box located in the People, Servers, Groups section. Select *Manager* from the Access Level section of the dialog box, click *Add*, and click *OK*.

2 Disable call waiting. The call-waiting service provided by most phone companies comes in handy when you're waiting for an important call and you get stuck listening to Aunt Mabel recount the latest accomplishments of little Johnny. But it can also be the death of a successful Notes connection. Fortunately, you can disable call waiting temporarily while you're working in Notes.

You can make this change either in the remote connection document for the server that you're calling or in the Tools•Call dialog box.

To make the change in the remote connection document, open your Personal Name & Address Book and select *View•Connections.* Then double-click the connection document for your server, and choose *Edit•Document* or press **<Ctrl>-E**. In the Dial Phone Number field, type ***70** in front of the number you're dialing (type **1170** if you're using a pulse or rotary phone).

If you're calling the Notes server directly, choose *Tools•Call,* select the server you're calling, enter ***70** (or **1170**) in the Dialing Prefix text box, and click *Auto Dial* to call the server.

3 Send mail from the server-based copy of your database. When you're working at home, it's sometimes quicker to call the server directly and check for new mail, especially when you have a fast modem. (For more information, see "Connecting a Remote Notes PC," *Suite Success,* June 1994.) But when you try to send mail, you get a message telling you to replicate the database, even though you are directly connected to the server.

Confused? I know I was, but there's a simple solution.

Your workstation is set up for workstation-based mail. To check, choose *Tools•Setup•Location.* In the Location Setup dialog box, make sure *Server-based mail* is selected, and click *OK.* When it is, and you work interactively, Notes uses your mail database on the server rather than your local copy.

If you like, you can have Notes display the Location dialog box automatically when you start Notes so that you can specify your location. To accomplish this, select *Do Location Setup every time Notes is started* in the Location Setup dialog box, and click *OK.*

4 Don't bite off more than your hard disk can chew. If the database you need to work with is huge, tell Notes to replicate only the information you need.

If you're creating a new replica of the database, you can opt to replicate only those documents created within a specific period. Select *File•New Replica,* and in the New Replica dialog box, select the *Only Replicate documents* box.

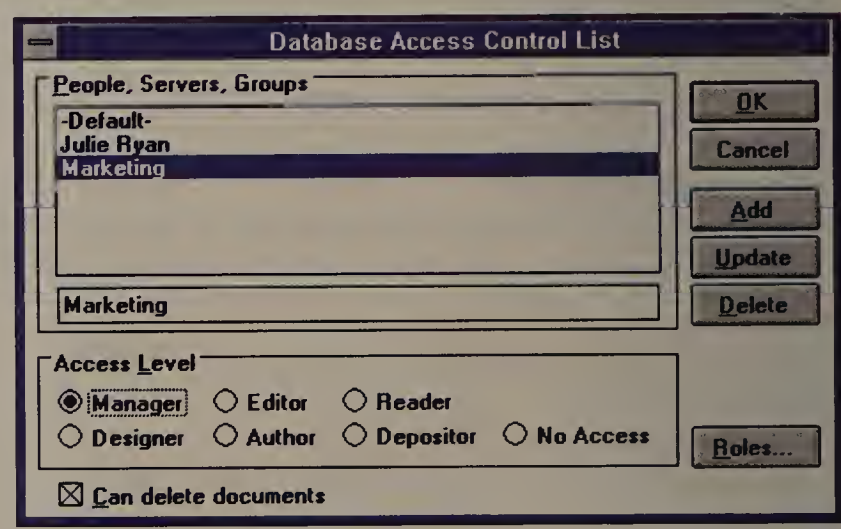


FIGURE 1: ASSIGN MANAGER ACCESS to your home server to ensure a successful replication when you're on the road.

For example, enter **30** to replicate only those documents that have been created within the last 30 days.

If you already have a replica of the database on your workstation, you can write a selective replication formula to specify the data that you want to receive the next time you replicate. To

do so, select the database, choose *File•Database•Information*, click the *Replication* button, then click the *Selective* button. To replicate the documents created by a certain someone, just enter **Select From = "*Certain Someone*"** in the Selective Replication dialog box. To replicate documents that were created after a certain date, enter **Select @Modified <= [*mm/dd/yy*]**.

A second option is to mail documents to yourself, then replicate your mail database to transfer the information to your workstation. To accomplish this, use the *Tools•Call* command to dial in to your server. Next, open the desired database, and when you find a document you want to use, choose *Mail•Forward*, address the mail message to yourself, and click *Send*. Finally, select your mail database on the server and choose *Tools•Replicate* to update your remote mail file.

5 Don't get hung up on an idle connection. How many times has this happened to you? You're working on an important document, you get up to refill your coffee cup, and when you return to your desk you find that you've lost your Notes connection. No, your modem isn't on the fritz—the problem is caused by the Hangup if Idle setting in the Ports Setup dialog box.

By default, Notes automatically disconnects after 15 minutes of idle time. One way to prevent disconnection is to save your work frequently. If you're composing a mail document, save the document rather than mailing it. If you're working in a shared database, indicate that the document is a draft.

You can change the Hangup if Idle setting, but it won't work unless the system administrator changes the setting on the server end as well.

To change the setting, choose *Tools•Setup•Ports*, click the *Additional Setup* button, enter a new value (for example **30**) in the Hangup if Idle text box, and then click *OK* twice.

SUITE MYSTERIES

AMI PRO

What About Text Files?

Q Is it possible to associate nonnative text files, such as ASCII, with Ami Pro? For example, I want to be able to double-click a file with a .txt extension (myfile.txt, for example) from within File Manager and have Ami Pro start with that file open.

John Linville, America Online

A Yes, it's possible. To begin, switch to Program Manager and choose *File•Run*. In the File Run dialog box, type **regedit** and click *OK*, and then in the Registration Info Editor, choose *Edit•Add File Type*.

In the resulting Add File Type dialog box, enter a name for the file type in both the Identifier and File Type fields—for example, **AmiProASCII**.

Next, select *Open* in the Action section, enter **amipro.exe** in the Command field (make sure you include both the drive and path name), and select *Uses DDE*.

In the DDE section of the dialog box, enter **[FileOpen("%1" 5 "ASCII")]** in both the DDE Message field and the DDE Application Not Running field, enter **amipro** in the Application field, and enter **system** in the Topic field. Click *OK* when you're done.

Now, switch back to File Manager, highlight any file with the appropriate extension (in this case .txt), and choose *File•Associate*. In the Associate With list box, select *AmiProASCII*, and click *OK*. The next time you double-click a file that has the extension .txt, Ami Pro will open and display the file.

You can quickly open text files in Ami Pro by creating a file association within the Windows File Manager.

APPROACH

A Custom Field

Q I would like to create a date format for one of the fields in my database. The field is used to track the month of acquisition for a fixed asset. I'd like the field to display the month and year only, such as 06/95. Any ideas on how to do this?

Gary Ottaviano, America Online

A Sure. You can create a custom field format.

To begin, open the database you want to customize and switch to Design mode. (Choose *Design* from the environment button.) Next, right-click the field whose format you want to customize and choose *Style & Properties* from the resulting shortcut menu. Then, in the InfoBox, click the *Format* tab (the one with the number sign) and choose *Date* from the Format Type list box. When you do, the current format is displayed in the text boxes to the right.

Each text box represents a different portion of a date—the day of the week it falls on, the day of the month, the month, and the year.

To display a date in the *mm/yy* format, choose the blank entry in the Day of Week field, select *02* for Month, select the blank entry in Day, and finally select *67* in the Year field. To add a separator to the format, enter a slash (/) in the text box to the right of the Month field. The date will be displayed as 06/95.

Send your questions to PC World Lotus Edition, Suite Success, *77 Franklin St. #300, Boston, MA 02110; to cathykenny on America Online; or to 72723,2071 on CompuServe. We pay $60 for each question we publish.*

6 Resolve database conflicts. Suppose someone makes changes to a document remotely, then replicates those changes while someone else is working on the same document. Do they cancel each other out? Does the best document win? Or are they both accepted?

Yes, yes, and yes. Notes does a combination of all three.

When Notes encounters two active versions of a document, it designates the version with the most changes as the main document and the other as a response to that document. In addition, Notes flags these conflicting documents with the '[Replication or Save Conflict]' message. However, if the document is edited in one replica but deleted in another, the deletion takes precedence. (To prevent deletions from being replicated to the server database, choose *File•Database•Information*, click *Replication*, select *Do not replicate deletions to replicas of this database*, and click *OK* twice.)

If you want to convert a response document to a main document, open that document, press **<Ctrl>-E**, and then choose *File•Save*. This removes the document's conflict status and promotes it to a main document. Next, select each of the response documents and choose *Edit•Cut*. Finally, highlight the main document and choose *Edit•Paste*. These steps demote the documents to response documents of the new main document.

7 Use your own address book. When you work remotely, you can't access the Public Name & Address Book—the names of all your colleagues, groups, connection documents, and company servers. That's probably a good thing, since the Public N&A Book may contain hundreds of documents that will surely eat up gobs of disk space.

However, you can easily get around this by copying the names of the users and groups to whom you regularly send mail from the Public N&A Book to your Personal N&A Book, and then storing it on your remote workstation.

First, open the Public N&A Book and choose *View•People*. Scan the list for the names you want to copy to your Personal N&A Book, and press the **<Space>** bar to select each name. Once the names are selected, choose *Edit•Copy*, open your Personal N&A Book, select *View•People*, and choose *Edit•Paste*. Perform these same steps for each of the different views. Then transfer a copy of the Personal N&A Book to your remote workstation.

The next time you're composing a mail message from your remote workstation, click the *Address* button or choose *Mail•Address* to display the entries in your Personal N&A Book.

If you need to send a message to someone who's not in your N&A Book, don't worry—just type in the name and address. Notes will return any misguided messages to you. Usually.

8 Deliver mail automatically. Wouldn't it be nice if Notes would check for all your new mail without any help from you? While you are having breakfast with your preschooler, Notes could replicate your sales database and send your mail to you.

No sweat. If your home PC is connected to a modem, set up a replication schedule, and you're on your way.

To try it, open your Personal N&A Book and choose *View•Connections*. Open the remote connection document for your server, and press **<Ctrl>-E**. Then, in the Scheduled Calling section of the document, specify when replication should occur (see **FIGURE 2**). For example, to have your workstation call the server every morning at 8 and then again at noon, 4 p.m., and 8 p.m., enter **8:00 AM – 8:00 PM** in the Call at Times field and **240** (for minutes) in the Repeat Interval Of field. In the Enabled/Disabled field, choose *Schedule Enabled*. Choose *File•Close* and click *Yes* when prompted to save your document. Lastly, choose *Tools•Replicate* and make sure *Transfer outgoing mail*, *Hangup when done*, and *Run in background* are selected.

(Oh, don't forget to warn Aunt Mabel not to call immediately before these specified times; Notes will fire away whether or not the phone line is in use.)

9 Don't leave work without these. Finally, to make sure you can always access your Notes server from the road, keep these items close at hand: your personal ID file (either on the hard disk or on a floppy) and a backup copy of that file; a copy of your Local N&A Book (names.nsf); a replica of your personal mail file; and replicas of the other databases you need to work with. You should also make sure you know the name and phone number(s) of the Notes server you'll be calling, just in case.

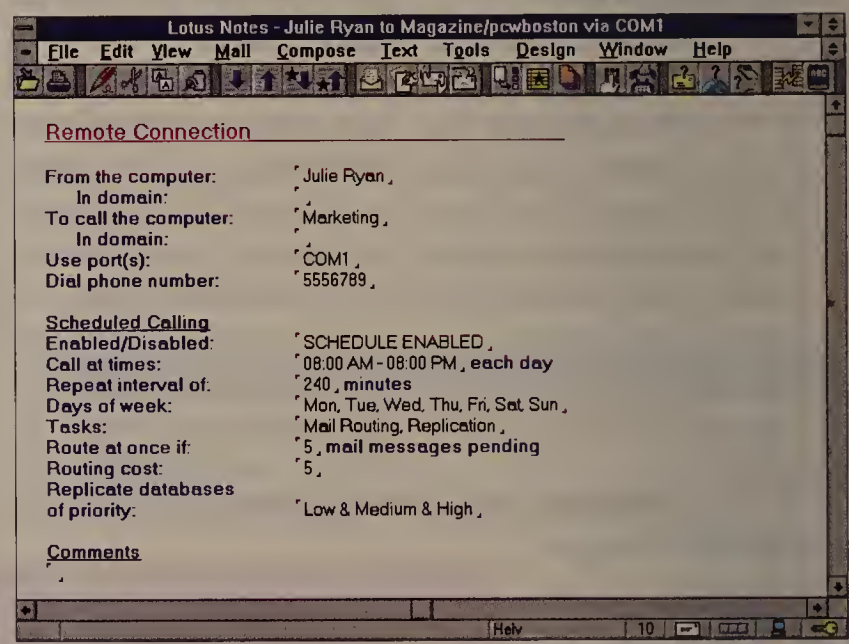
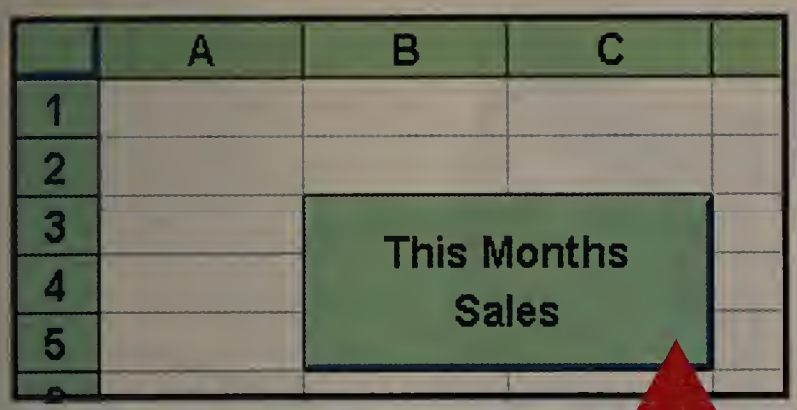


FIGURE 2: LET NOTES GET YOUR MAIL FOR YOU by scheduling an automatic replication. Here, the server is called every four hours.

By Catherine Kenny

Catherine Kenny is an associate editor for PC World Lotus Edition *who sometimes works at home via Notes. Special thanks to Stephen Londergan, coauthor of* Lotus Notes for Dummies *(IDG Books, 1994, 800/762-2974) for ensuring the technical accuracy of this article*



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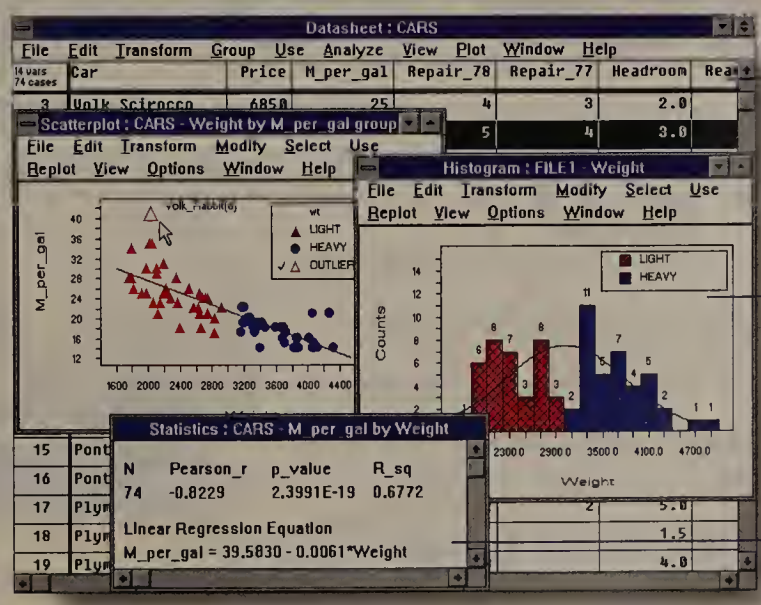

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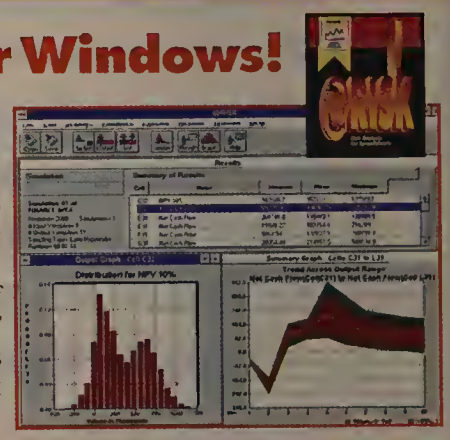

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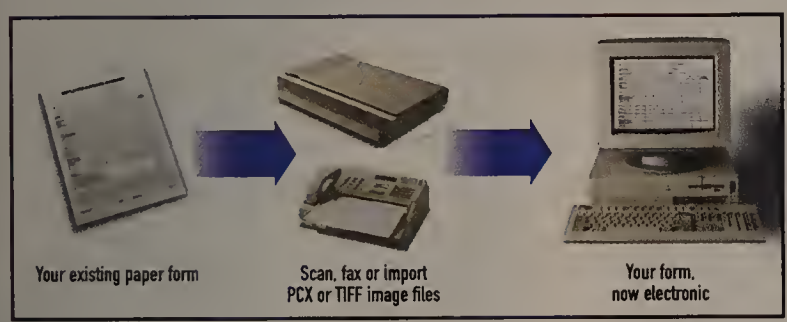

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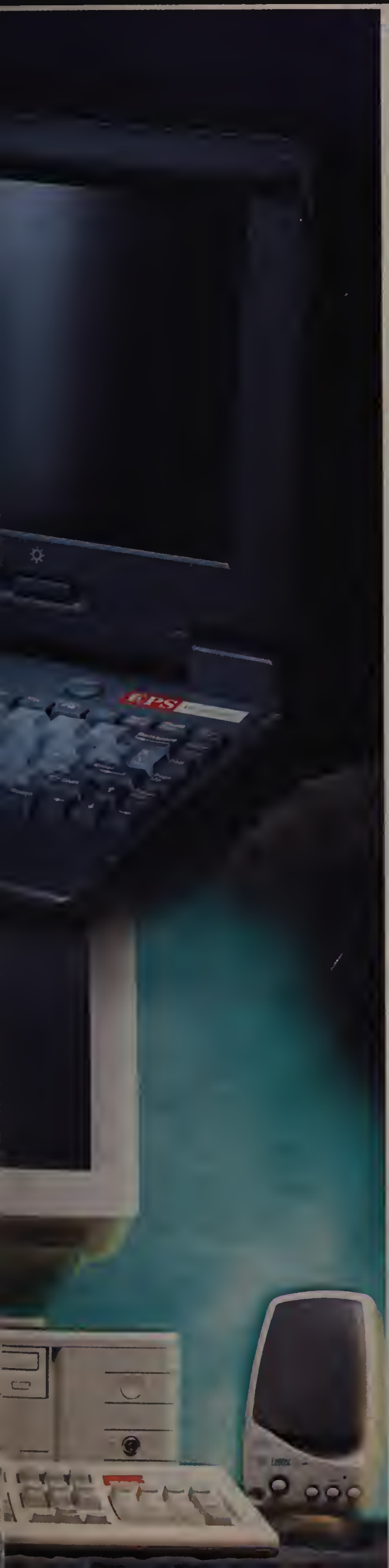

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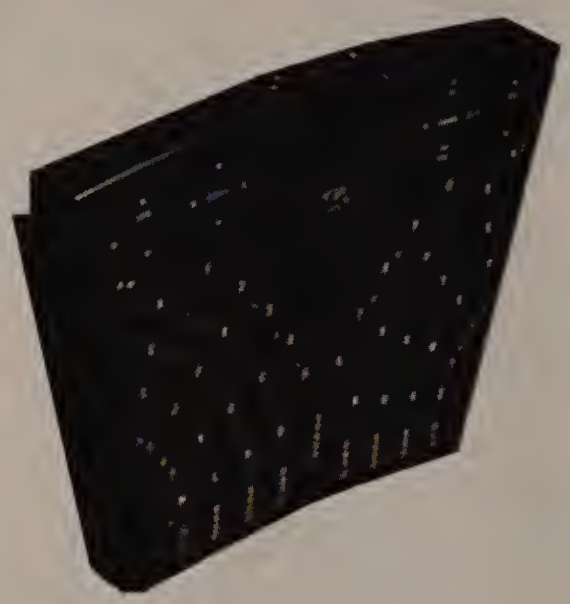

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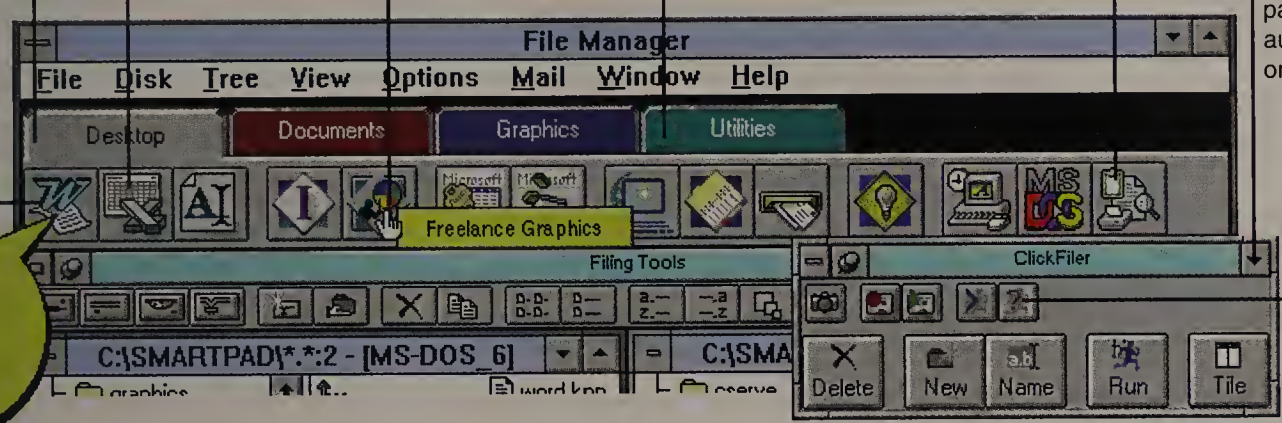

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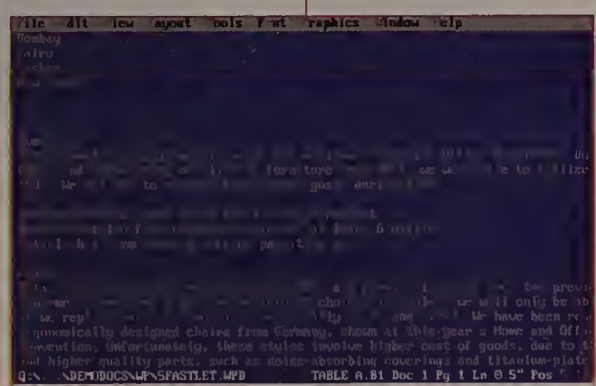

The skills you learned using 5.1 will be just as valuable in 6.0. Coaches™ can even help you improve those skills by teaching you better ways to use WordPerfect.

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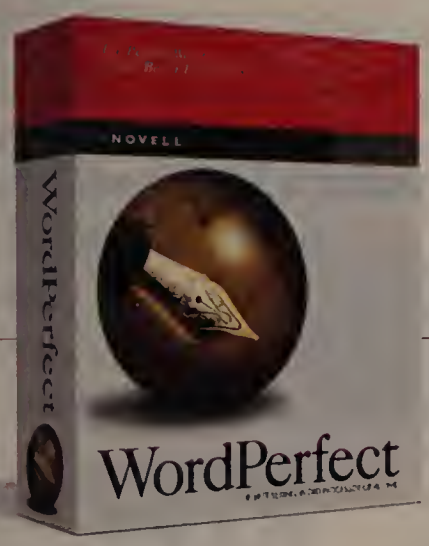

WHAT'S NEW?

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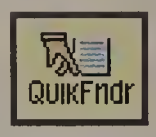
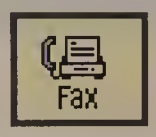
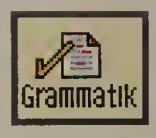


QuickFinder—Need to find a file fast? Just type in a word or a phrase, and 6.0 finds any file containing that reference.



Fax—Save time by sending and receiving faxes directly to and from your word processor.



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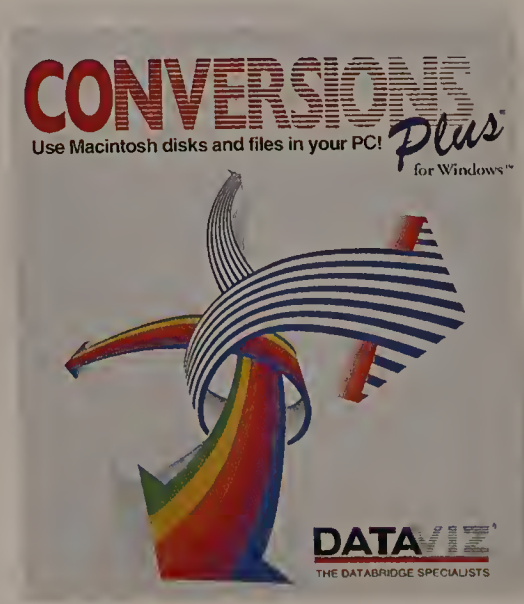

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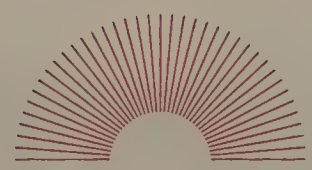

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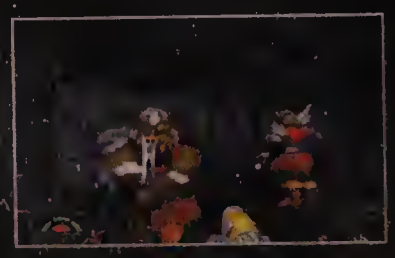

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From the Editors of Child and PC World

WHAT'S INSIDE

S4 Catch the Software Wave

S11 In Living Color
A Parent's Guide to Color Printers

S16 How I Planned My Summer Vacation (With My Computer's Help)

Illustration: Mark Von Ulrich Design: Don Morris Design.

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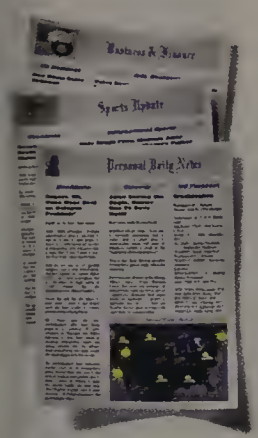

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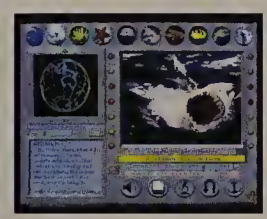

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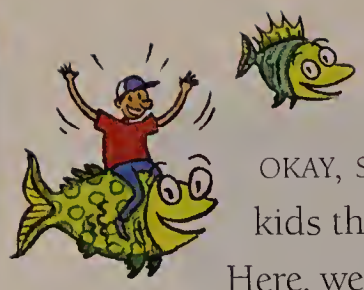


OKAY, SO YOUR HOME PC ISN'T THE FIRST THING YOU OR YOUR kids think of when summer rolls around. Well, think again. Here, we review some of the best children's software. Whether you want a package that's "Pure Fun" or a little off-season learning ("Summer School"), there's sure to be a program perfect for a long summer day.

Creative Crafts · Summer School · Pure Fun · Mysteries and Mind Benders

Ages 3 to 6

by Michael C. Perkins and Célia Nuñez

The Book of Shadowboxes

HERE'S A NEW TWIST ON LEARNING the alphabet. This program uses charming rhymes and games to help preschoolers practice their ABCs. It's an ideal choice for your child's first interactive storybook. In the program's engaging treasure hunt game, children are asked to click on each object in a letter's shadowbox that is not mentioned in the rhyme. It's a clever way for kids to sharpen their language and observation skills while they have some fun. IBM Multimedia Studio (800) 898-8842 or (615) 793-5090; Windows CD-ROM, $32.

Freddi Fish and the Case of the Missing Kelp Seeds

THE CREATORS OF PUTT PUTT have done it again. Their new release lets kids explore an undersea world as they solve an intriguing mystery: Where are Grandma Grouper's stolen kelp seeds? As they roam underwater, kids will need to keep a sharp eye out, especially since they're not alone—tailing Freddi and her friend Luther are two shady sharks, also on the lookout for the kelp seeds! Humongous Entertainment (206) 485-1212; Windows CD-ROM, $40.

Freddi Fish

Sammy's Science House

WITH THE HELP OF CHARMING characters and engaging music, children can have fun learning about basic science. In the workshop, kids get to build a wide range of toys and machines. They can manipulate variables like wind and rain with a weather machine, then see the effects in animation. It's a friendly introduction to science, with activities that reward a child's natural curiosity. Edmark (800) 691-2985 or (206) 556-8484; Macintosh, DOS, and Windows disk and CD-ROM, $35.

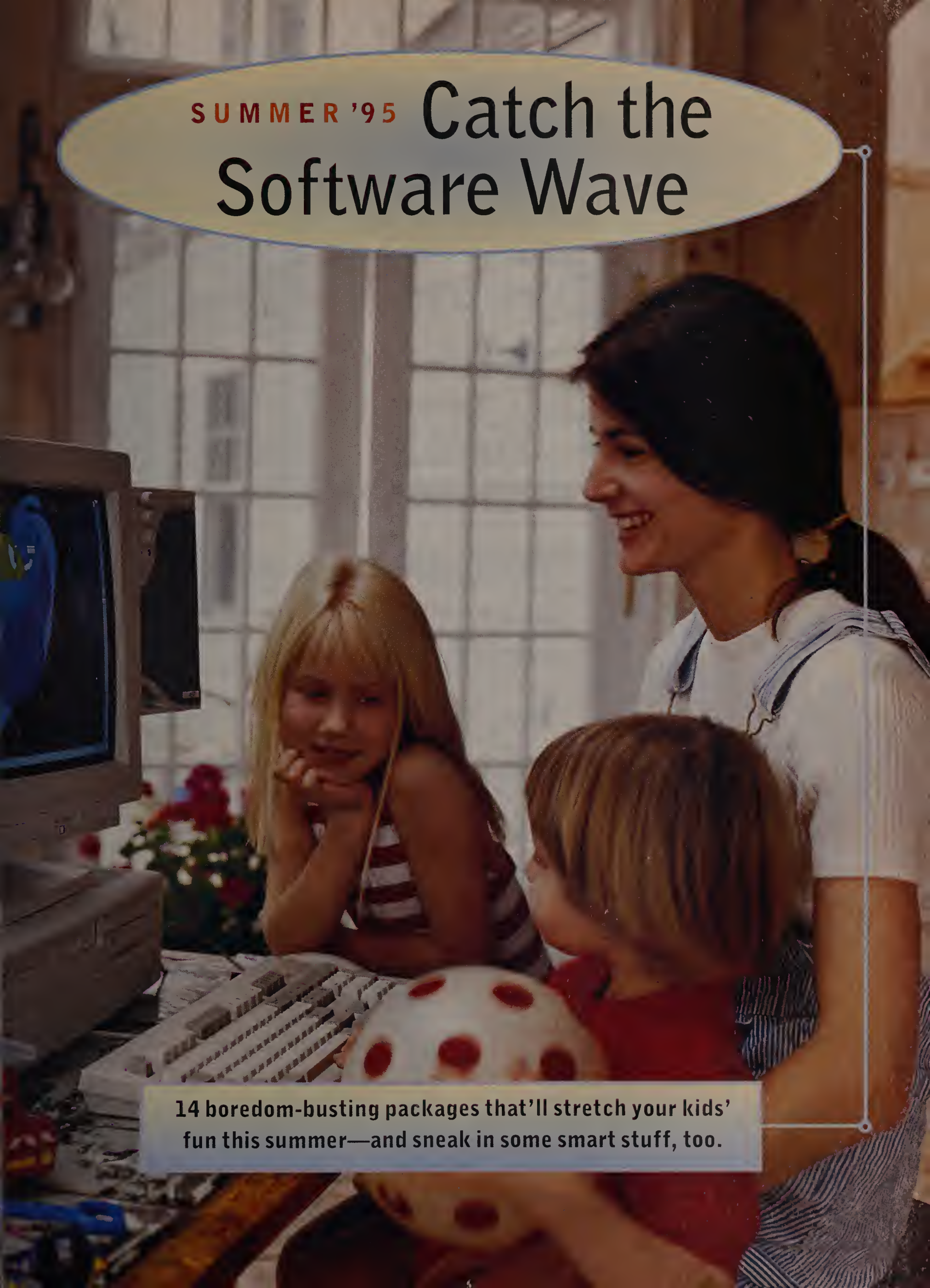
Scooter's Magic Castle

KIDS WILL HAVE HOURS OF fun playing challenging games while they explore Scooter's Magic Castle. The program has 15 engaging, kid-friendly activities—from solving puzzles to creating clown faces. Most activities have three levels of difficulty to accommodate kids of different ages. This program will have a long life on your electronic bookshelf. ABC/EA Home Software (800) 245-4525 or (415) 571-7171; DOS disk and CD-ROM, $40.

Scooter's Magic Castle

Photography: Mark Thomas. Illustration: David Goldin. Icons: Mark Von Ulrich.

For more information about all products in this article, circle reader service number 904.



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Ages 7 to 9

by Peter Scisco

SimTown

IF KIDS COULD DESIGN THEIR own town, they'd no doubt dump generic-looking pizza parlors for something much more interesting—like maybe a building that's a big piece of pizza with pepperoni slices for windows. Whimsical cartoon buildings are just some of the excellent elements in this electronic city planner for kids—a scaled-down version of SimCity, the hit simulation package for older kids and adults. Underneath the great fun there are some serious choices to make: Children must balance the needs of business with the needs of their citizens and the environment. Children can also define up to four animated characters, specifying their likes and dislikes. In addition, there's a town mayor, to make sure things run smoothly. Maxis (800) 526-2947; Macintosh CD-ROM, $45.

Where in the World Is Carmen Sandiego?

Junior Detective Edition

WHEN IT COMES TO TRACKING the most famous criminal in computer game history, younger siblings don't have to sit on the sidelines anymore. Carmen Sandiego's gang of ne'er-do-wells are now wreaking havoc in an entertaining edition for junior sleuths. Kids assume the role of a detective in the ACME Detective Agency, then pursue Carmen and her gang throughout the world. During their trip, kids learn interesting facts, such as a country's favorite pastime or the design of its flag. There's no violence here—just the challenge of foiling Carmen's plans to steal valuable landmarks and other treasures. Brøderbund Software (415) 382-4569 or (800) 521-6263; Windows and Macintosh CD-ROM, $50.

Carmen Sandiego, Junior Detective Edition

Catch the Software Wave

The Incredible Toon Machine

THE GOAL OF THIS PROGRAM is to solve hundreds of wacky visual puzzles using cartoon logic. The main characters, Sid and Al, provide comic relief. Each engaging puzzle has a goal, but there can be more than one solution. Some puzzles are funnier than others, but all will inspire chuckles. Kids can even try creating their own cartoons. Put this on your home PC, and watching television cartoons on Saturday morning may be a thing of the past. Sierra (800) 757-7707 or (206) 649-9800; DOS, Windows, Macintosh disks, $35; Windows CD-ROM, $40.

Anno's Learning Games

THIS COLLECTION OF EIGHT activities is sure to challenge—and entertain—your child for hours at a time. From mind-bending puzzles and games, to card making and story writing activities that stretch creativity, this program will keep kids coming back for fun. Putnam New Media (800) 631-8571 or (703) 860-3375; Windows and Macintosh CD-ROM, $30.

Anno's Learning Games

Ages 10 and Over

by Ann Orr and Warren Buckleitner

Nickelodeon Director's Lab

THIS PROGRAM—AND A LITTLE creativity—are all kids need to create their own 70-second videos. From the main lobby, children have access to seven rooms: Soundtracks are created in the Music Studio, and the Title Editor types up titles, headlines, and credits. In the Video Suite, kids can experiment with frame-by-frame editing of video and animation sequences. A stop in the Sound FX Room lets children create their own noises or choose from 304 sound effects (like applause, wind, or creaks). True to the spirit of Nickelodeon, there's a bit of dripping slime and pie-in-the-face humor, but under the glitz is a professional tool that is easy for kids to use. Viacom New Media (800) 469-2539 or (212) 258-6000; Windows CD-ROM, $60.

The howler monkey's call can be heard for several miles.

Perfect material for a kid's story.

Kids will also have a great time writing about the eagle that flies 50 miles per hour. And the lizard that runs on top of the water. These are just some of the intriguing facts kids will discover as they explore *Destination: Rain Forest,* Edmark's new, interactive story-making CD-ROM from the *Imagination Express* series.

This colorful destination teaches kids about life in the Panamanian rain forest, while inspiring them to create interactive stories. Just as fascinating and educational are *Destination: Castle* and *Destination: Neighborhood,* all for kids ages 6-12.

Whether playing on their own or with friends, kids will find it easy and fun to select background scenes, plan the plot, narrate pages, and cast characters as well as animate them. They also get to add music and their own sound effects. Then they can watch their silly, exciting or suspenseful tale unfold right in front of their eyes, or print their own creations.

With every story that kids produce, they'll be strengthening their creativity, writing and communication skills. They'll also be doing lots of giggling, laughing and downright howling of their own.

EDMARK®

The Imagination Express series is available at Barnes and Noble, CompUSA, Computer City, Egghead Software, Electronics Boutique, Imaginarium, LearningSmith, Media Play, MicroCenter, Software Etc., Staples, Zany Brainy and other fine retailers. For more information about Edmark and our products, call 1-800-691-2986.

Circle 135 on reader service card

Aviation Adventure

PACKED WITH ACTIVITIES, information, and flight simulations, Aviation Adventure is sure to capture your child's attention. From footage of the *Hindenburg* crash to animated movies of F-15e/MiG-23 dogfights, the past, present, and future of aviation is presented in a variety of formats. A visit to the Aviation Lab familiarizes kids with the inner workings of aircraft. In the Museum, kids learn

Aviation Adventure

about aerodynamics and famous pilots. There's even a video arcade-style glider game, and—for the ultimate challenge—a flight simulator that sends the advanced user on missions to save the world! Knowledge Adventure (800) 542-4240 or (818) 542-4200; Windows CD-ROM, $29 to $39.

SimTower

YOUR TEENAGER CAN BE TRANSformed into the ultimate real estate tycoon with SimTower, where she'll develop and manage her own skyscraper. Starting from the ground up, kids create towers by building offices, restaurants, condos, and shops. Rent is collected from the tenants, but just like in the real world, if you don't keep your tenants happy, they'll leave you high and dry. The objective of this simulation is to develop and maintain a profitable piece of real estate and to advance from a Single Star one-story establishment to a Five Star 100-story empire. To meet this challenge, players must be prepared for unexpected fires, terrorist attacks, and other disasters. Maxis (800) 526-2947; Macintosh disk, $45.

Microsoft Complete Baseball Guide

Microsoft Complete Baseball Guide

THROUGH VIDEO CLIPS, PHOtos, illustrations, and text, kids can experience baseball's most exciting moments. This CD is filled with biographies and statistics of players, past and present, and includes team stats for the American and National Leagues. There's a Trivia Challenge with over 900 questions. And with a modem, players have access to Microsoft Baseball Daily, an on-line service that provides schedules, stats, and standings. Kids and parents alike will enjoy tracking their team's performance. Plus, the CD version never goes on strike! Microsoft (800) 936-3500 or (206) 882-8080; Windows CD-ROM, $50.●

Michael C. Perkins and Célia Nuñez are the authors of KidWare: The Parent's Guide to Software for Children. *Peter Scisco is a father and freelance writer living in Winston-Salem, North Carolina. Warren Buckleitner is the editor of* Children's Software Revue, *to which Ann Orr is a contributor.*

Software for the Whole Family

The Way Things Work In this program, a friendly woolly mammoth answers kids' questions about machines, inventions, and technology. Starting in an inventor's workshop, concepts both ancient and modern are introduced by mini movies and then explained in greater detail as kids click on the subject of their choice. Literally hundreds of topics are presented in a lighthearted way, giving kids the opportunity to explore and apply principles of science as they test out inventions and build machinery. Dorling Kindersley Multimedia (800) 356-6575; Macintosh and Windows CD-ROM, $50.

Better Homes and Gardens Cool Crafts This new CD-ROM is so full of creative ideas that you and your kids will never run out of activities. There are instructions for more than 100 craft projects, each introduced by a video segment. A narrator walks you through making everything from finger puppets to finger foods. Kids can save their favorite craft ideas in a special folder for quick access. If you're stuck for ideas but have some spare supplies, you can tell the program what you have and it will suggest a project. Multicom Publishing (800) 850-7272; Windows and Macintosh CD-ROM, $40.

SUPPOSE YOU'RE READING A FIFTH GRADE SCIENCE BOOK. Yawn, not much to excite the neurons in here. Now, turn a 180° on the fun scale.

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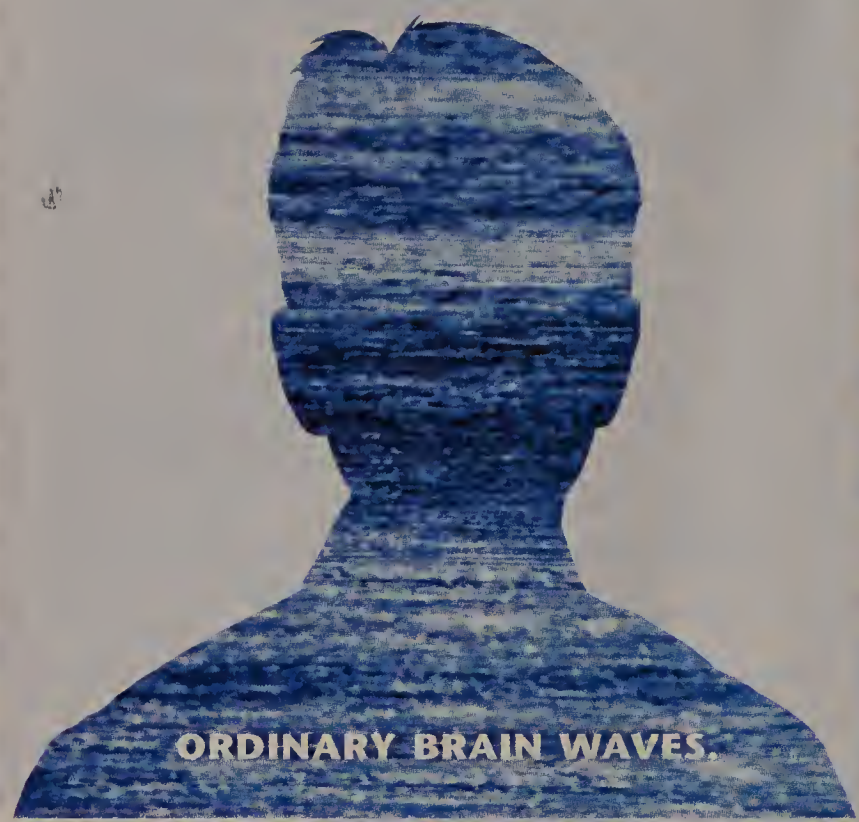

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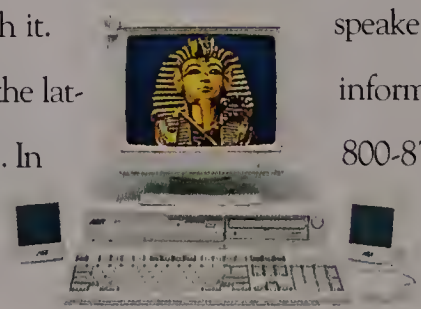

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Circle 58 on reader service card

In Living Color

A Parent's Guide to New (and Affordable) Color Printers • by Eric Knorr

INTRODUCE KIDS to a computer, and the first thing that they want to do is play with color. Whether they're fiddling around with the Paintbrush program in Windows or creating a masterpiece in KidPix 2, kids love to see their work illustrated on screen in 256 brilliant colors. But sooner or later, the question arises: "Can I print it out?" And any parent who's handed over a printout from a dot matrix or laser printer knows that traditional black-and-white copies just don't cut it.

Kids are proud of their work, and color ink-jet printers let them show it off. Compact and quiet, color ink jets are now less expensive than ever before: You can buy a decent one for less than $300.

The Real Cost of Color

WE TESTED SIX LEADING COLOR ink-jet printers for the home: Lexmark's ExecJet IIc; Epson's Stylus Color; Hewlett-Packard's DeskJet 560C and DeskJet 540C; and Canon's BJC-600e and BJC-4000. Although the printers range in price from roughly $300 to $550, even the least expensive unit can meet the needs of most color-hungry families.

If you're buying a color ink jet just for the kids, you may be tempted to get the cheapest model you can find. But you also need to factor in the cost of consumables, namely paper and ink cartridges. Depending on how prolific your young artist is—and how efficiently the printer uses its resources—you might pay as much for con-

5 Color Ink-Jet Tips To Try

1. Supplies aren't cheap. In one year you can spend as much on ink cartridges as you did on the printer itself. Check out the price of cartridges before you buy.

2. Four-color printers are best. Only four-color printers give you true black with graphics. With three-color units, you'll need to swap in a black cartridge.

3. Play with paper. Coated ink-jet paper is best, but experiment with different stock. Prices and output quality vary considerably.

4. Tinker with settings. Getting top-quality printouts with an ink jet takes work. The only way to find the best settings is to read the manual—and experiment.

5. Handle with care. Prevent smearing by letting the ink dry before touching printouts. For best results, run the printer's self-cleaning routine periodically. *–EK*

Photography: Mark Thomas

For more information about all the products in this article, circle reader service number 905.

sumables in one year as you did for the printer.

Let's look at two examples. Lexmark's ExecJet IIc sells for $350. But if your kids create 10 color drawings a week, each one cov-

Epson's Stylus Color is pricey but saves on ink.

ering about 50 percent of the page, in one year you'll spend more than $300 on cartridges—just about the cost of the printer itself. At the other extreme is Epson's Stylus Color. Selling for roughly $550, it costs $200 more than the ExecJet IIc, but consumes far less ink. The same volume of color printing would cost under $100 in cartridges; so by the middle of the second year of ownership, the Stylus Color would end up costing less than the ExecJet IIc.

The best overall value we found was Canon's BJC-4000. This printer is only slightly more expensive to use than the Stylus Color, and it sells for around $350. You'll pay less in the first year for a BJC-4000 and its cartridges than for any other color ink-jet solution—provided your kids print, say, 300 or more color-rich pages during that time. If you don't think your kids will do that much color printing, then the printer with the lowest price tag is probably the best deal for your family.

Color Control

THE MOST IMPORTANT CLUE TO a color printer's output quality is whether it uses four inks—cyan, magenta, yellow, and black—or just three. Three-ink printers, such as the DeskJet 540C or the ExecJet IIc, don't produce a true black. Instead you get an inferior composite black, which often looks slightly greenish.

For the kind of chunky graphics kids generally produce, Canon's four-color BJC-600e and BJC-4000 deliver the best results, turning out clean lines and vibrant colors (the Screen-Matched Color mode produces the brightest hues). The Stylus Color provides even sharper lines, but you might want to crank up the

Canon's BJC-600e prints clean lines and great colors.

reds in the Printer Options dialog box to give colors more zing. You'll need to adjust the colors on all the printers, so be prepared to tinker a bit with settings until you're happy with the printouts.

Just as you'll need to experiment with the controls to get the best color, you'll also want to try out different kinds of paper stock to see which work best for you and your kids. Some ink jets, such as the DeskJets and ExecJet IIc,

THINK LIKE A CHILD.

you're walking down sesame street and there's Elmo! so you click on him and he wants to play a game with numbers AND oh! Big Bird wan

don't do as well with plain paper which soaks up too much color ink, making lines fuzzy. You can reduce ink absorbency—and make colors really come alive—by using special ink-jet paper, which ranges in price from $5-a-ream sheets that are a slight improvement over plain paper, to $1-a-page stuff that you'll want to save for special presentations or Grandma's birthday card. Generally, a coated page printed on even the worst color ink jet looks more exciting than a plain paper page printed on the best ink jet. (For best results, remember to indicate that you're using coated stock in your Printer Options dialog box.)

HP's DeskJet 540C: when you need sharp text, too.

The most important clue to a color printer's output quality is whether it uses four inks.

When Text Also Matters

IF YOU WORK AT HOME AND want your kids' color dream machine to do double duty as a business printer, you need an ink jet that can imitate a laser printer. To that end, look no further than the DeskJet 540C. It's fast and produces plain-paper text pages that can't be distinguished from laser output without a magnifying glass. (The 540C is a three-color printer, so you'll need to swap the color cartridge for a black one to produce top-notch text.) HP's 560C is a four-color machine, but at $150 more, it's only necessary if you need business-class color.

In its high resolution mode, the Stylus Color produces even sharper text than the DeskJets, albeit at about half the speed. Unfortunately, the Stylus Color needs its 12-cents-a-page paper for this resolution, so you can forget about economical volume printing. The Canon BJCs and the ExecJet IIc are disappointing text printers (though they're adequate for correspondence) and just as slow as the Stylus Color when trying to look their best.

As a rule, ink-jet printers are slow. All of these printers offer a fast-draft mode, but the quality of the printouts varies. The DeskJets and the Stylus Color deliver draft text that you won't be ashamed of, but the BJCs and the ExecJet IIc produce fuzzier characters that are for your eyes only.

Whether you're looking for an all-purpose home printer or an expensive toy, there's a color ink jet to suit you and your kids. And once you see how much fun they're having with it, you may discover some artistic inclinations of your own. ●

Eric Knorr is a contributing editor of PC World *and the editor and principal author of* The PC Bible *(Peachpit Press, Berkeley, 1995).*

Illustration: David Goldin

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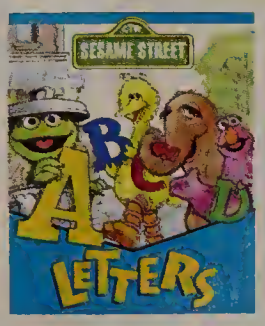
abc ea HOME SOFTWARE



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TO PLAY LETTER SEARCH AND THEN MOM SHOWS UP AND WHEN SHE SAYS IT'S TIME FOR BED

...NOW YOU CAN SPELL IT.

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And then I started playing with *Stradiwackius, The Counting Concert.* **And** listened to a funny song about circus pianos. **And** then I clicked on Albert **and** found out all about pianos. **And** then I clicked on Wendy **and** got to make my own music. **And** then I clicked on Pablo **and**...**and** got to paint a piano in lots of great colors **and** even make my own wacky instrument. **And** then I did it all again in French. **And** in Spanish. **And** in German. **And** then I did it nine more times with nine different instrument songs. **And** then I switched to a new one—*Four Footed Friends.* **And** started all over again, learning all about rhymes **and** animals **and**... **and** spelling **and** lots of other fun stuff. **And** then my mom told me it was time for dinner. **And** that's when she said to never start a sentence with **and**.

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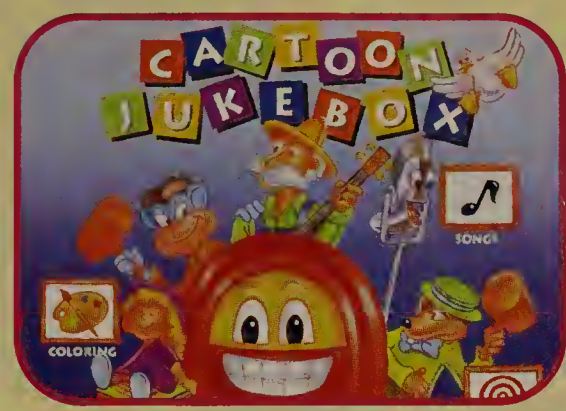
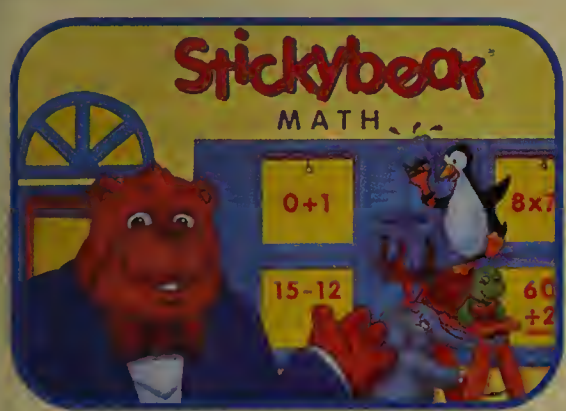


Crayon Factory
Kids learn about colors and solve problems logically while touring a crayon factory run by lovable robots. On CD-i. Coming soon on CD-ROM.

Most children think an afternoon filled with math and reading is about as much fun as, well, an afternoon filled with math and reading. That is until they feast their eyes on five exciting programs from The Philips Family Entertainment Library. Programs that will have them laughing and learning through hours of enriching interactive activities. Programs so fun and amusing your kids won't even mind the educational part. Call the number below for more information or to order any of the discs shown. And who knows, you may actually live to hear the words "Please, Mom, just one more multiplication table."

We *work* VERY HARD TO create *quality* educational PROGRAMMING. And *still children* JUST laugh at us.



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Sandy's Circus Adventure
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PHILIPS

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Circle 189 on reader service card

How I Planned My Summer Vacation

Before you hit the road, hit the computer: Fun new software puts maps, itineraries, even reservations at your fingertips • by Mindy Pantiel

THAT OLD EXPRESSION "GETTING THERE IS HALF the fun" never described any of my family's summer vacations. Just hours into any driving trip we'd find ourselves parked on the shoulder as my parents wrestled with a map and argued about whose fault it was that we'd missed a crucial exit. Meanwhile, in the backseat, my sisters and I helped out by whining, "When are we gonna get there?"

Fortunately, such travel nightmares may soon be a thing of the past, thanks to the introduction of a wide array of software and online services designed to help plot the perfect trip. And since these computer resources are simple to use, your kids can pitch in and help you plan your vacation—a great summer project. They can even print out maps and listings to create their own personalized guidebooks. Here are the easy how-tos.

1. Map It Out For those who favor car travel, **Rand McNally's TripMaker** ($80, 800-671-5006, ext. 110) and **AAA Trip Planner** ($60, 800-284-2045) specialize in road trips. In a few minutes, you can figure out the mileage for the shortest and/or most scenic routes to a destination, and even gas costs. Then simply type in how many hours you want to drive each day, and the program creates customized maps, complete with detailed directions.

2. Scope Out the Sights Several packages also provide historical and recreational information on thousands of places. For example, your child could scan TripMaker's Fun for Kids category to see what strikes his fancy at a particular destination, then print out info-packed listings.

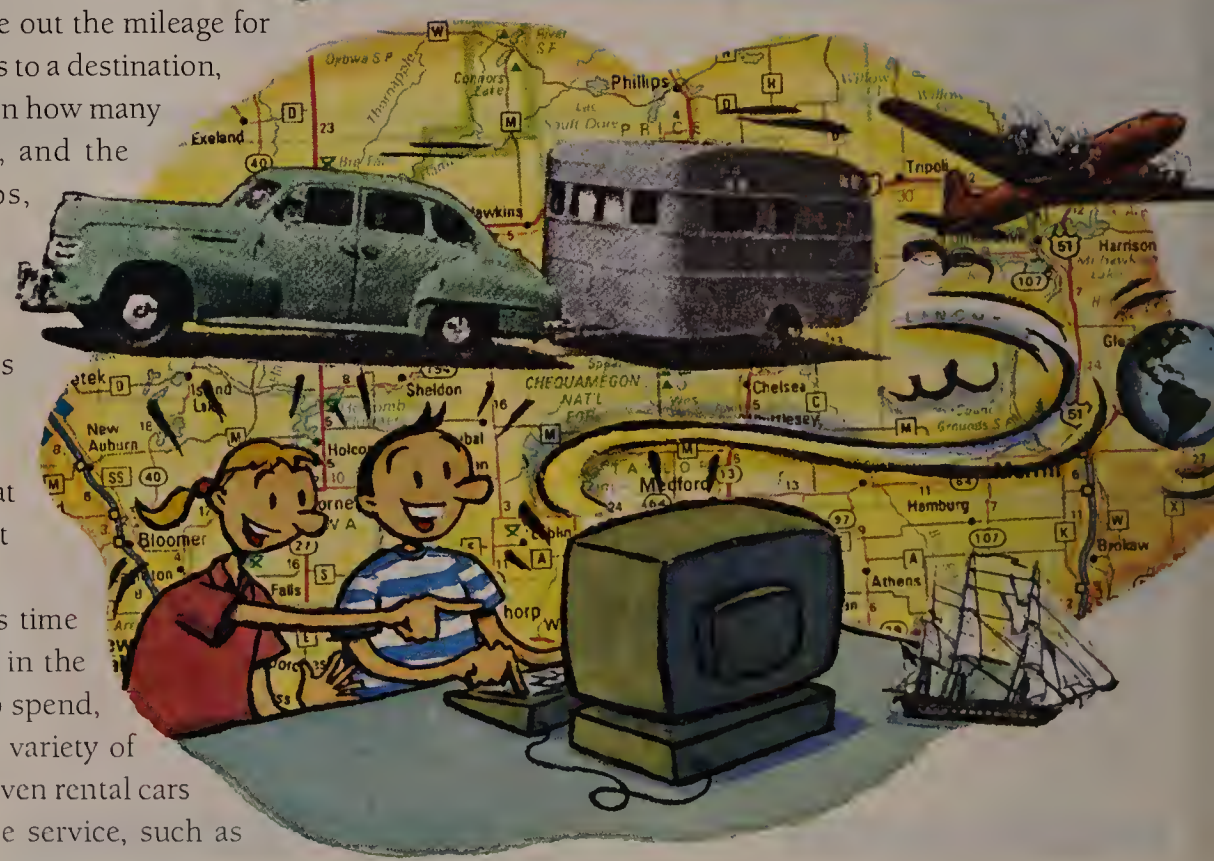
3. Book 'Em, Dano When it comes time for hotel reservations, simply punch in the location and the amount you want to spend, and AAA Trip Planner will provide a variety of choices. Booking hotels, flights, and even rental cars can also be done by using an online service, such as America Online, Prodigy, or CompuServe. If you book the reservations yourself, some services even pass part of the discount usually given to travel agents along to you (about 10 percent). Also available online: detailed destination profiles and bulletin boards that allow you to ask fellow travelers' advice about the best place to stay at Disney World or how to prepare for a family trek to Nepal.

4. Put It All Together Once your planning is done, help your children gather all their maps and printouts to produce their own homemade travel guide (use a paint program or crayons to create covers and illustrations). Such a book is sure to be invaluable during the trip, as well as a wonderful souvenir afterward. And in the fall, when your kids are asked to write the inevitable "What I Did During My Summer Vacation" essay, how they planned it is sure to be a big part of the story. •

Mindy Pantiel is a freelance writer based in Boulder, Colorado.

Once You Get There

If you're visiting Chicago, Los Angeles, New York, or a variety of other cities, it might be worth taking a laptop along to have access to Taxi ($70, 800-439-8294). Kids will love using this software "tour guide" to map out the best routes from your hotel to all the sights and back again.



Illustrations: David Goldin.

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ABOUT YOUR CHILD'S PC USE

Do you have children in any of these age groups? (Mark all that apply)

- ○ 0–2 years
- ○ 3–5 years
- ○ 6–10 years
- ○ 11–14 years
- ○ 15–18 years
- ○ 19–21 years
- ○ 22+
- ○ No children

Do your children use a computer at home?

○ Yes ○ No

What kind of software do they use or do you plan to buy for them? (Mark all that apply)

	Use	Plan to buy		Use	Plan to buy
Pre-reading and pre-math	○	○	Game	○	○
Reading	○	○	Entertainment	○	○
Math	○	○	Geography	○	○
Drawing or art	○	○	Typing	○	○
Storybook	○	○	History	○	○
Word processing	○	○	Exploration or adventure	○	○
Spreadsheet	○	○	Logic or problem solving	○	○
Science	○	○	Simulation or role playing	○	○
Reference	○	○	Other	○	○

Do your children use an online service?

○ Yes ○ No

Which articles in this section did you read? How valuable did you find them?

	READ		VALUE TO YOU				
	All	Some	Not at all				Extremely
Summer '95: Catch the Software Wave	○	○	○	○	○	○	○
In Living Color: A Parent's Guide to New (And Affordable) Color Printers	○	○	○	○	○	○	○
How I Planned My Summer Vacation	○	○	○	○	○	○	○

Please rate your interest in the following types of articles relating to kids and computers.

	INTEREST IN READING				
	Not at all				Extremely
Comparative reviews of PCs	○	○	○	○	○
Reviews of educational software	○	○	○	○	○
Reviews of reference software	○	○	○	○	○
Reviews of games	○	○	○	○	○
Reviews of online services	○	○	○	○	○
Tips on using hardware	○	○	○	○	○
Tips on using software	○	○	○	○	○
Consumer protection information	○	○	○	○	○
Feature stories on computers in schools	○	○	○	○	○
PC-based activities	○	○	○	○	○
How-to and Q&A	○	○	○	○	○
Software reviews based on hands-on testing by children	○	○	○	○	○

Please rate the importance of computers in your child's education.

IMPORTANCE				
Not at all				Extremely
○	○	○	○	○

How much influence do your children personally exert in purchases of the following computer products for home? (Answer for each type bought/considered)

	AMOUNT OF PURCHASE INFLUENCE CHILDREN EXERT				
	None		Some		A Lot
Personal computer	○	○	○	○	○
Education/entertainment software	○	○	○	○	○
Other software applications	○	○	○	○	○
Printers	○	○	○	○	○
Other peripherals	○	○	○	○	○

ABOUT YOU AND YOUR HOUSEHOLD

Do you use a computer at home or work?

- ○ At home
- ○ At work
- ○ Both at home and at work
- ○ Do not use a computer

What kind of computer, if any, do you have at home?

- ○ Pentium
- ○ 486
- ○ 386
- ○ 286
- ○ Macintosh
- ○ Other
- ○ No computer at home

Will you get a new computer for home anytime in the next 12 months?

○ Yes ○ No ○ Not sure

What type of computer might you get?

- ○ Pentium
- ○ 486
- ○ 386
- ○ Macintosh
- ○ Other
- ○ Not sure

Which of the following peripherals do you use or plan to buy? (Mark all that apply)

- ○ Laser printer
- ○ Ink jet printer
- ○ Color printer
- ○ CD ROM drive
- ○ Sound card
- ○ Modem

Which online services do you subscribe to at home? (Mark all that apply)

- ○ America Online
- ○ CompuServe
- ○ Delphi
- ○ GEnie
- ○ Imagination Network
- ○ Prodigy
- ○ Other
- ○ None

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intel inside

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INSIDE

122 Web Browsers

141 Online Services

153 Fax-Comm Software

164 Fax-Modems

All You Need to Go Online

Get ready.

The communications explosion has just begun, and your PC is at the center of it all. In this special section we identify the tools you'll need, whether you're connecting to a fax machine, logging on to an online service, or cruising the World Wide Web.

Your PC has grown up. No longer the gawky adolescent, that drab-looking box isn't limited simply to *computing* anymore. It's blossomed into a full-grown communicator. It calls, it answers. It faxes, it E-mails. It uploads, it downloads. It does video conferencing, it lets you conduct virtual meetings; it does lunch. But not without help, which is where we come in. In this issue we look at all the tools you need to harness your PC's communications power.

We start with the Internet, zeroing in on the World Wide Web (known affectionately as the Web). The fastest growing part of the Internet, the Web has pictures, sound, and hyperlinks that—with the aid of a program called a browser—let you move effortlessly across the Internet from one document to another. The ten next-generation browsers we examine here advance the state of the art, with added features such as security and technical support.

Will the Web lessen the demand for commercial online services, such as America Online and CompuServe? Judge for yourself with our hands-on evaluation of today's top five services. The best online services are getting easier to set up and use, while providing timely, well-organized information. They're also beefing up their links to the Internet. Prodigy was the first service to offer a graphical Web browser, and America Online's browser was being readied for launch at deadline.

Fax software and data communications programs round out the must-have software list for the serious communicator. Taking a cue from the major business software companies, which bundle their applications as a software suite, many developers now sell fax and data communications software in one box—think of it as a communications suite. We review six fax-and-communications combos, telling you which are the best of breed and summing up what they can—and can't—do for your modem.

Of course, you can't get anywhere without a modem. We review seven of the fastest, most reliable fax-modems available today. Based on the new V.34 specification, these modems promise communications speeds up to 28.8 kbps. So get ready. Communications isn't just a trend—it's a tide.

BY CHRISTOPHER BARR

STEVEN LYONS

BEST Web Browsers

Millions of people, and thousands of businesses, are racing to take advantage of a new electronic medium called the World Wide Web.

Simply put, the Web is a system for accessing information on the Internet. Using a special application known as a Web browser, you can access hyperlinked multimedia Web documents—also known as *pages* or *sites*—stored on Internet-connected computers around the world. Thanks to its ease of use, multimedia capabilities, and interactivity, the Web has been hailed by some as the most important advance in publishing since the printing press. Others have called it the greatest productivity drain since Doom and the most overhyped technology since pen-based computing.

So, will the Web evolve into the model for the promised information superhighway, or is it simply a dead end that will be overtaken by another technology for sharing information on an international scale? Who knows? All that's certain is that the Web is the hottest thing online. It's the fastest-growing service on the fast-growing Internet, which connects more than 50,000 computer networks used by tens of millions of people worldwide. Analysts estimate that 2 million people now have access to the Web and that several million more will join them as the major online services—Prodigy, America Online, and CompuServe—roll out Web browsers of their own.

BY PETER H. LEWIS

A guide to the World Wide Web—the hottest spot on the Internet—and the top Windows software for getting there.

What Is the Web?

The World Wide Web started in 1989 at the European Center for Particle Physics in Geneva (known by its French acronym, CERN) as a way for scientists to publish *hypertext* documents over the Internet. Hypertext is familiar to anyone who's used a Windows help file: Double-clicking a highlighted phrase on one page summons a second page explaining the phrase more fully. On the Web, hyperlinking allows a user to follow ideas and themes from one Web page to another, regardless of whether those pages are stored on a single computer (or *Web server*) or scattered on servers around the world. (In Netspeak, this hopscotching is variously referred to as *browsing*, *cruising*, and *surfing*.)

Eventually, Web publishers began creating their pages using something called Hypertext Markup Language (HTML). In addition to hyperlinking, HTML also supports high-resolution graphics, audio, and video and lets page designers organize text as hierarchical elements, such as titles, headings, and body text. The widespread use of HTML means Web pages can look and feel more polished and varied than the content you typically find on commercial online services like America Online or Prodigy.

Mosaic: Killer App of the Web?

The Web expanded slowly until late 1993, when programmers at the University of Illinois' National Center for Supercomputing Applications released Mosaic, a piece of freeware that translated HTML coding into attractive, interactive Web pages. By making the Web accessible to a vast new audience, Mosaic quickly became the killer app of the Internet.

It also spurred competition: Some 18 months after Mosaic was introduced, it's now just one of several Windows-based browsers. And these programs now do more than just let you view Web pages. Many also give you access to other Internet services, including E-mail, Gopher, file transfer protocol (FTP), Usenet news, and Wide Area Information Servers (WAIS). In other words, a Web browser could be the only software tool you'll need to make the Internet easier than ever to access.

To use these new tools, however, you need special communications software that supports Transmission Control Protocol/Internet Protocol (TCP/IP), the lingua franca of the Internet. TCP/IP software is sometimes bundled with the Web browser and is otherwise available for free over the Internet. Browsers also require a special connection, either through your local area network or via modem to an Internet service provider (ISP) using a special communications protocol called Serial Line Internet Protocol (SLIP) or Point to Point Protocol (PPP). Modem users be warned, though: Because of its extensive use of graphics, the Web is no place for puny 9600-bits-

STEVEN LYONS

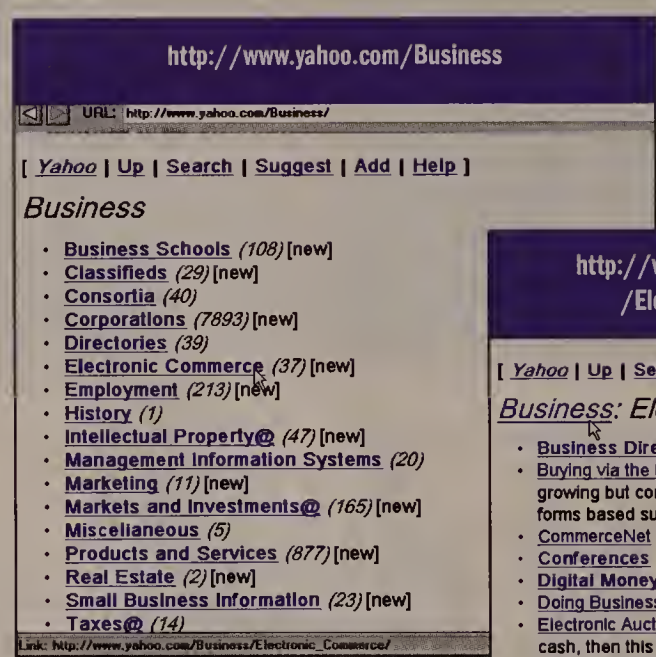
per-second (bps) weaklings. Even at 14,400 bps or 28,800 bps, cruising the Web can seem like wading in quicksand.

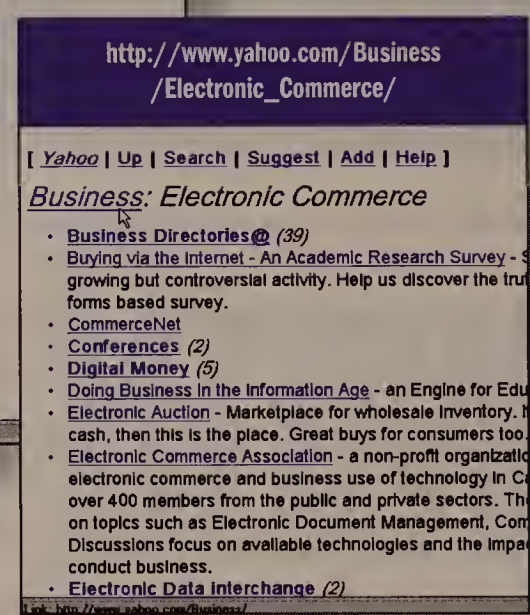
For users who'd rather not hassle with acquiring and configuring TCP/IP and SLIP or PPP accounts, IBM offers a relatively painless Web connection as an option in its OS/2 Warp operating system (see "Warp Onto the Net With Web Explorer"), and Microsoft says it will do the same in the second generation of Windows 95. Meanwhile, the major commercial online services—including Prodigy, CompuServe, and America Online—have already made, or will soon make, Web access a standard part of their offerings (see "Online Services Get Webbed").

Do-It-Yourself Web Pages

The advent of Mosaic has also accelerated the shift of Web usage from scientists and academics to commercial and consumer users, and it has spurred the creation of Web pages that include color pictures, sounds, interactive forms, and even video clips. Hundreds of thousands of Web pages have been created already, and the numbers are expected to rise quickly into the millions.

Who's creating all these pages? Art galleries, museums, schools, magazines, civic organizations, cities; even the Library of Congress is on the Web. Californians used the Web last fall to broadcast election results before the television stations did. The White House has a Web site complete with a sound clip provided by Socks, the First Cat. You can find a scholarly Web treatise, complete with dramatic photos, on how to make strawberry Pop-Tarts erupt in flames in a toaster. And, yes, you can even find the kitchen sink (along with other plumbing supplies) on the Web.





Businesses are especially intrigued by the Web, seeing it as the modern, cyberspace equivalent of an exotic trade route to new markets. Every day dozens of new businesses—ranging from tattoo parlors to multinational corporations—set up *home pages* or electronic storefronts on the Web, hoping to snare new customers through the personal computer.

But establishing a presence on the Web is no trivial task. First you need to create your HTML files. By the time you read this, Microsoft and Novell will be offering add-ons for Word and WordPerfect that translate word-processing documents into HTML, enabling virtually everyone who uses a PC to become a Web publisher (see our comprehensive guide in *Top of the News*). Third-party utilities from Interleaf and Quarterdeck, among other companies, will do the same thing. Before long, a Save as HTML command will be standard in many business apps.

Once you've created your HTML documents, you need to put them on a Web server where Web users can get at them. You could do it yourself, but you'd need a PC running Web server software, along with a router and some kind of high-speed phone line. Better you should let somebody else handle Web services for you. This can be as simple as renting some space on your local ISP's Web server and a portion of the provider's high-speed phone line (typically superfast T-1 or T-3 connections).

Traffic Jams Ahead

But before you rush out to sign up for your PPP account or space on a server, be warned that all is not rosy in Web-land. With the phenomenal growth of the Internet, and with potentially millions of new users coming aboard the World Wide Web from the commercial online services, there is growing concern that the Web may outstrip the Internet's carrying capacity. While graphics and multimedia make Web pages look and sound cool, they also take up huge chunks of bandwidth.

And because of the Web's ease of use and accessibility, more users than ever are cruising the Net. Can the Net handle all this extra traffic? Technical experts are of mixed opinions: While some argue that the Net's resources are expanding to meet the growing demand, others note that it's getting more difficult to get connected to popular sites. For example, logging onto Netscape Communications' Web site to get a copy of Netscape Navigator (**http://home.Netscape.com**) can be an ordeal, given the thousands of users who try to access the site every day.

"Should we be advertising

Security is another big issue. A pair of security schemes—known by the acronyms SHTTP and SSL—are competing to be adopted as the standard for financial transactions over the Web. Once the Web's powers-that-be establish such a standard—the decision is expected any day now—even more businesses will likely set up Web pages. But news accounts of hackers grabbing passwords and credit card information online have made some businesses justifiably wary about joining the rush to the Web.

In the meantime, the Web is becoming easier to use than ever for publishers and end users—it's the 1990s equivalent of desktop publishing, only the audience is global, the medium is interactive, and you don't need paper. To help you on your way, *PC World* has assembled the following review of Windows Web browsers. We also asked the experts for their opinions on great (and not-so-great) Web pages. It's everything you need to get your Webfeet wet.

Peter H. Lewis covers cyberspace for The New York Times.

Windows Web Browsers

BY JEFFREY SYMOENS

To find out which Windows-based Web browser is the best, we took ten of them out for a spin. We chose three freeware programs (Cello, NCSA Mosaic, and winWeb), three commercial browsers (Enhanced Mosaic, Mosaic in a Box, and Netscape Navigator), and four all-in-one Internet suites that include browsers (Internet Chameleon, InternetWorks, NetCruiser Plus, and SuperHighway Access for Windows).

We started our evaluation with installation. Some browsers completely automate the setup process: They establish an account with an access provider and configure the bundled TCP/ IP software appropriately. Others let you set up an account on your own but walk you through the process of configuring the TCP/IP. A third group of browsers leaves everything up to you—you set up your own account and TCP/IP.

With the browsers ready to go, we checked their navigation tools—text boxes for entering a page's address (officially known as its Universal Resource Locator, or *URL*), links, toolbars, hot lists (customizable compendia of your favorite sites), and history logs (automatic lists of the sites you've visited in a given Web session). We also took a look at how well each program reports on the progress of a download. Some programs show you the number of bytes transmitted, some indicate the percentage of the page that's arrived, and others use a thermometer-style gauge.

e Web? Think I'll start with Yahoo—it has a zillion links. Let's see, I'll try Business and Electronic Commerce."

How Fast Can You Web?

Next we turned our attention to performance—a key issue when you access the graphics-intensive Web. Unfortunately, there's no reliable way to compare browser speed. Too many variables come into play—conditions at your access provider as well as traffic on the Net as a whole and at the page you're visiting—to allow for accurate benchmarking.

But you can check to be sure a browser is doing everything it can to maximize performance. First, it should let you turn off the graphics, which take longer to download than text. Second, it should download text first, so you can start reading while the graphics load. Third, it should let you load more than one page at a time. Finally, it should cache pages in memory or on disk, so you can reload a previously visited page quickly.

A browser should also support some form of security. Most browsers offer basic authentication, a simple password-and-username scheme. But for transactions such as credit card purchases, your browser should also support either the Secure HTTP (SHTTP) or Secure Sockets Layer (SSL) security standards.

Finally, a browser should let you view as many graphics formats as possible. Most browsers come with their own internal viewers for the most common graphics formats, including GIF, JPEG, and BMP. Most also let you use third-party viewers for formats they can't view themselves.

Jeffrey Symoens is a technical analyst for InfoWorld *magazine. Paul Hutmacher is a purchasing manager, writer, and OS/2 user in Houston. Dan Miller is an associate editor for* PC World. *Thanks to slip.net of San Francisco for PPP services.*

For more information about all products in this article, circle reader service no. 903.

Best Buys

Of the ten browsers we looked at, three of them stood out as the best: NavISoft's InternetWorks, Netscape Navigator, and winWeb. Our overall favorite is Netscape Navigator. It does a great job of maximizing performance, making your Web browsing smooth and seamless. It also offers state-of-the art security and exemplary navigation tools.

We'd recommend NaviSoft's InternetWorks for those who want a full set of Internet tools that includes an E-mail utility, FTP, Gopher, and a reader for Usenet news groups. InternetWorks uses a unique set of navigational metaphors, but once you've learned them they're incredibly easy to use.

Finally, for those on a budget, we recommend winWeb. This is the best freeware browser that we looked at, and it has more performance enhancements than NCSA Mosaic and better navigational tools than Cello.

InternetWorks

Navigator

winWeb

Cello 1.01a

PROS: Simple setup and customization, free

CONS: Lacks basic navigation tools, no multiple downloads, no printed documentation

Developed at Cornell Law School, Cello was one of NCSA Mosaic's first rivals in the Windows Web browser arena. While a version 2.0 is forthcoming, it wasn't available for our review; we had to settle for Cello version 1.01a, which dates from early 1994. Unfortunately, things move fast in the browser business, and this version is beginning to show its age.

Setting up Cello was a snap: As soon as we'd configured our TCP/IP stack, the program was ready to run. But once we were up and Webbing, we found Cello lacked many basic navigation features. Its toolbar is stark, with buttons for back, stop, home, and nothing more. (The next version will add buttons for searching, copying, and other activities.) Also, Cello was the only browser that didn't let us enter a URL on the toolbar; if we wanted to type in a page's address by hand, we had to delve into the menus. And once we started downloading a page, Cello told us only how many bytes it had received, not how many were left to go.

"The Internet Business Center looks promising."

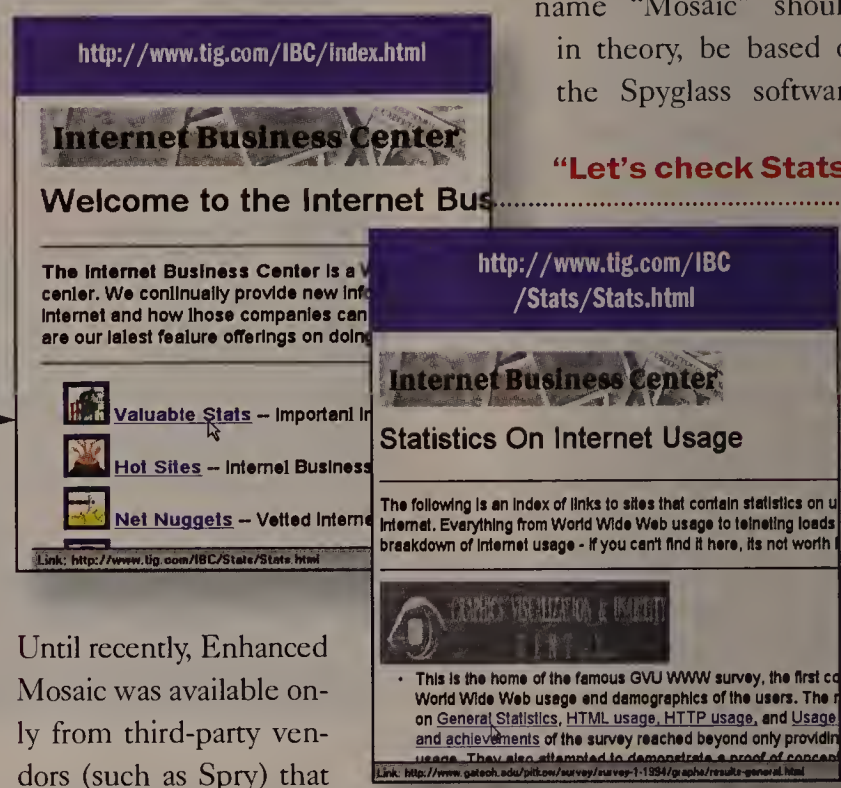
As for performance, the current version of Cello is one of the browsers that doesn't support multiple downloads; the next version will. While this and other promised improvements may make Cello 2.0 more competitive, for now we'd stick with winWeb or one of the commercial packages. Use anonymous FTP to download Cello from **ftp.law.cornell.edu**, directory **pub/ LII/Cello**. *The Legal Information Institute, Cornell Law School, 607/255-6536.*

Enhanced Mosaic 2.0

PROS: Advanced security schemes, good performance

CONS: Help, setup, and documentation depends on licensee

Enhanced Mosaic is Spyglass's official commercial version of NCSA's freeware Mosaic; any commercial product that bears the name "Mosaic" should, in theory, be based on the Spyglass software.

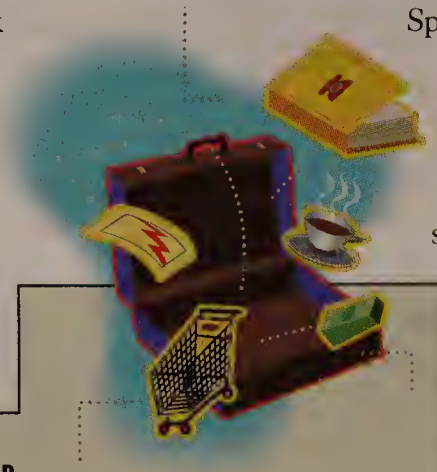


"Let's check Stats."

Until recently, Enhanced Mosaic was available only from third-party vendors (such as Spry) that licensed the program from Spyglass. But Spyglass recently announced it would begin selling Enhanced Mosaic under its own brand. In the process, Spyglass promised it would revise the browser to make it competitive with well-established commercial products such as Netscape and InternetWorks.

To accomplish this, Spyglass had to improve Enhanced Mosaic's performance and security. The browser now supports multiple downloads and lets users proceed to a second page before the first finishes loading. As with most other browsers, you can adjust the size of the cache; unlike most others, you tell Enhanced Mosaic how many pages and images (rather than bytes) you want cached—a more intuitive solution. As for security, the new Enhanced Mosaic supports private key encryption and SHTTP. The toolbar is also much improved, with new buttons that stop downloads, reload the current page, move to the next page, and open the hot list.

Two crucial features—account setup and documentation—are the responsibility of individual licensees; the stand-alone Spyglass version we tested hadn't implemented either one. That's why, until we see the final version of Enhanced Mosaic, we can't recommend it over Netscape or InternetWorks. But assuming Spyglass implements these features intelligently,



Top 5 Business Sites

BY THE EDITORS OF GLOBAL NETWORK NAVIGATOR

1. **Commercial Services on the Net. The Internet equivalent of a telephone directory's business pages. Maintained by Open Market Inc., it contains links to more than 2200 businesses.** http://www.directory.net/
2. **Internet Shopping Network. With backing from the Home Shopping Network, this is the mall to watch on the World Wide Web.** http://www.internet.net
3. **Security APL. An excellent example of how you can use free information to attract attention to your products and services. Includes a free stock quote server.** http://www.secapl.com/secapl/Welcome.html
4. **Wells Fargo's Home Page. Once the Web's security infrastructure is in place, you'll be able to use online sites like this one to pay bills, find out your bank balance, even apply for loans. Until then...**http://www.wellsfargo.com/
5. **Thanksgiving Coffee Company. How does a tiny company achieve global reach? By offering its products over the Net.** http://gnn.com/gnn/bus/tgcoffee/index.html

GNN is an Internet-based publisher and the sponsor of the annual Best of the Web contest. It can be reached at http://gnn.com.

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Circle 244 on reader service card

the forthcoming commercial version of Enhanced Mosaic should give its competitors a strong run for the money. *Spyglass Inc., 708/505-1010* **Reader service no. 620**

Internet Chameleon 4.1

PROS: Easy setup, choice of service providers, full suite of Internet tools

CONS: Balky link handling, no status info

If setup were all that mattered, then WebSurfer, the browser included in NetManage's $125

"Internet demographics!"

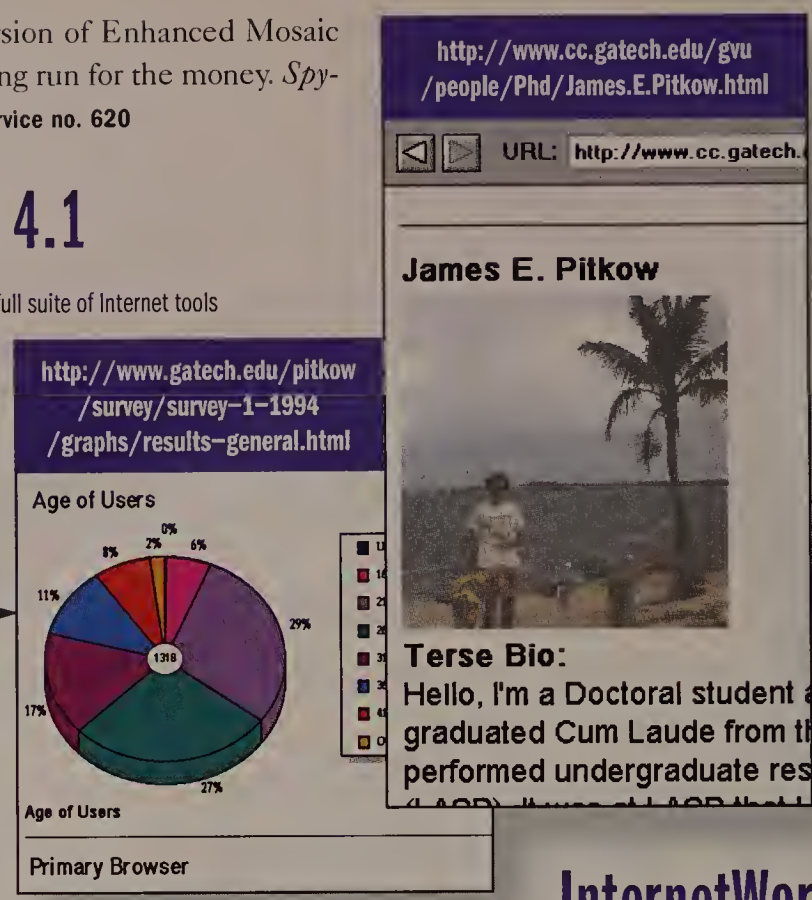
Internet Chameleon suite, would be a Best Buy. The suite completely automates the process of setting up an Internet account. You can immediately establish an account with one of five default vendors or set up an account of your own. Fonts and colors are also conveniently customizable.

But once we took WebSurfer out for a ride, our initial impression turned sour. We'd click on a link and nothing would happen. Click a second time and we'd get an error message. Click a third time and, finally, the page would load. These glitches cropped up only when we used links—the toolbars, history list and hot list all worked just fine. The program's lack of feedback only exacerbated our frustration with the missing links. When we clicked on a link (or typed in a URL or selected a page from the hot list), we had no way of knowing whether the next

"Who did this page?"

page was actually loading or how long it would take to finish.

If you're looking for an all-in-one suite, you might consider Internet Chameleon. But we'd recommend InternetWorks or possibly SuperHighway Access instead. *NetManage Inc., 408/ 973-7171* **Reader service no. 621**



InternetWorks 1.0

PROS: Innovative navigation tools, excellent performance, great price for an all-in-one suite

CONS: No advanced security features

NaviSoft's InternetWorks has its own way of doing things. For instance, it's an all-in-one Internet suite that, at $49.95 list, costs as little as some of the stand-alone browsers. Also, it uses its own unique set of navigational metaphors. For

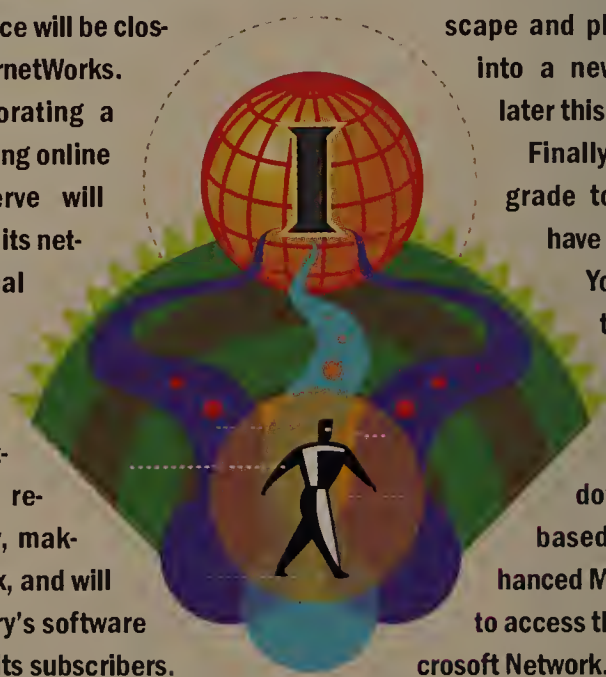
Online Services Get Webbed

The major online services—America Online, CompuServe, Delphi, Prodigy, and the forthcoming Microsoft Network—either offer or promise Web browsers of their own.

Prodigy is the first and, at press time, *only* online service with graphical access to the Web. What's most impressive, given Prodigy's otherwise antiquated interface, is the browser's slick Windows look and feel. Prodigy has maximized performance by caching popular Web pages on your local server (so you don't have to fetch the pages over the Net) and copies of frequently requested graphics—such as company logos—on your local hard disk.

Not to be left behind, America Online promises to debut a Web browser any day now, to be based on InternetWorks (AOL recently acquired InternetWorks' maker, NaviSoft). According to AOL, you'll access the Web from the service's existing Internet Center (which already offers FTP, Gopher, Usenet news groups, E-mail, and WAIS). AOL officials say the browser's user interface will be closer to AOL than to InternetWorks.

Instead of incorporating a browser into its existing online interface, CompuServe will offer PPP access over its network. You'll dial a local CompuServe access number, then log in to the Net using TCP/IP. As for software, CompuServe recently acquired Spry, makers of Mosaic in a Box, and will presumably make Spry's software readily accessible to its subscribers.



Delphi has offered Internet access longer than any of the other online services, but its interface hasn't kept up. Delphi currently offers a text-based Web browser, which gives you hypertext links but doesn't support graphics. This situation should improve: Delphi has licensed browser technology from Netscape and plans to incorporate it into a new interface debuting later this year.

Finally, if you decide to upgrade to Windows 95, you'll have two more Web options: You'll be able to get at the Web through a standard Internet account, using TCP/IP drivers built into Windows 95 and a browser based on Spyglass's Enhanced Mosaic. Or you'll be able to access the Web through the Microsoft Network. The company says this new online service will have full Internet access by the end of 1995, including Web access based on Spyglass's technology.—Dan Miller

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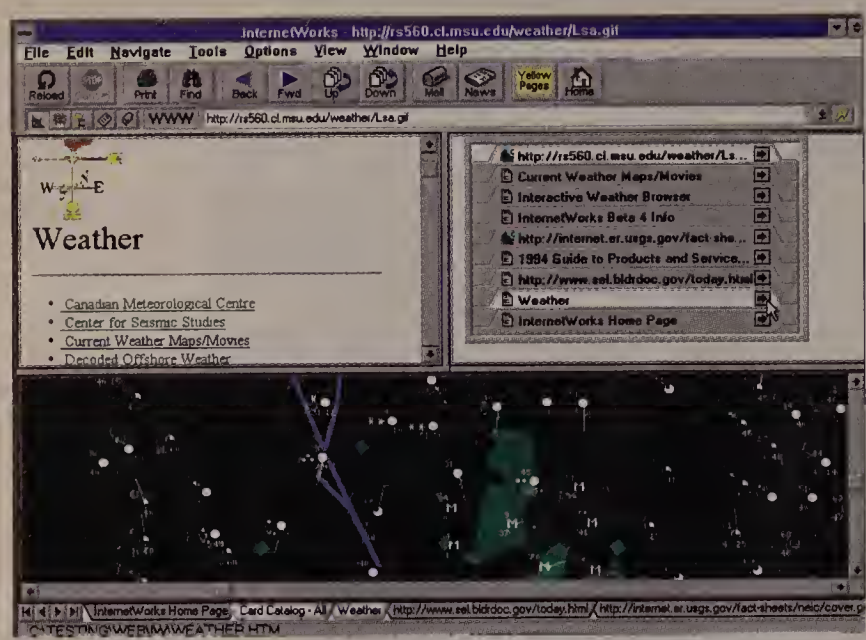
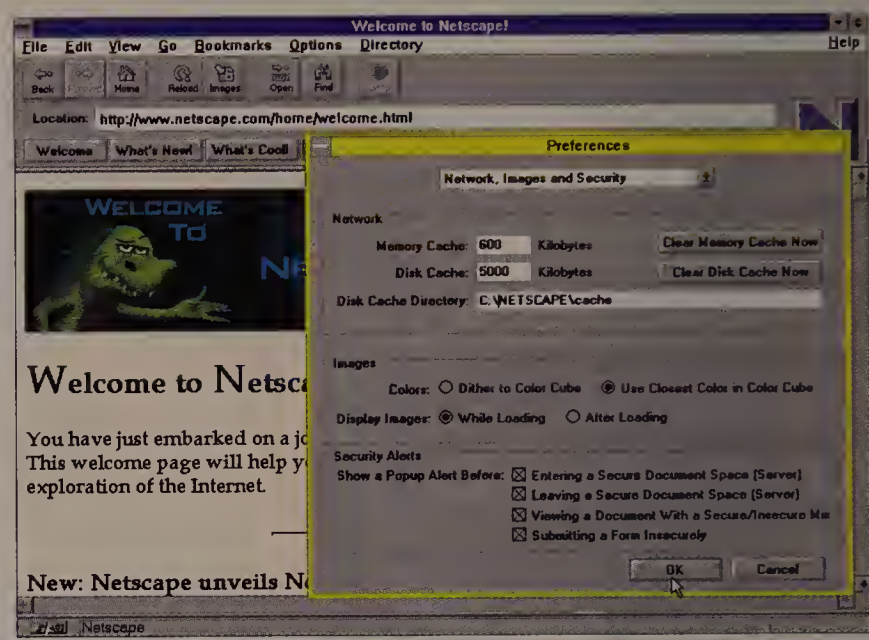
Circle 240 on reader service card



INTERNETWORKS DISPLAYS MULTIPLE WEB PAGES in secondary windows and uses a card catalog instead of a hot list.



NETSCAPE LETS YOU CUSTOMIZE its multiple security measures as well as its memory and disk caching.

example, instead of starting on a home page stored somewhere online, InternetWorks opens on a locally stored table of contents, organized by topic. Instead of using a traditional history log, it creates a row of tabs along the bottom of the page; instead of a hot list, it uses a card catalog. It's also the only browser that let us view multiple pages simultaneously in side-by-side windows.

Some of InternetWorks' other differences we weren't so fond of. When we navigated from one page to another, the previous page disappeared, leaving us with nothing to look at but a count of incoming bytes. And InternetWorks lacks the fancier security measures available from other packages. But these quibbles don't change our feeling that InternetWorks is by far the best of the four all-in-one Internet suites we looked at.

Note: We reviewed a prerelease version of InternetWorks. At press time, NaviSoft said the product would ship after May. *NaviSoft, 800/453-7873* **Reader service no. 622**

Mosaic in a Box 1.0

PROS: Automatic setup, Image View utility, outlined hot lists

CONS: Automatic setup works with just one access provider

If your primary concern is ease of use, check out Spry's Mosaic in a Box: It makes connecting to the Web virtually painless. We filled in a couple of dialog boxes, then selected a local access number. The program dialed a default PPP provider (CompuServe), registered us, and that was it—we were up and cruising the Net. Unfortunately, it's this easy only if you're willing to sign on with CompuServe; if not, you'll have to configure the software by hand.

In addition to ease of use, Mosaic in a Box has an excellent utility, Image View, for viewing and editing JPEG, BMP, GIF, and other images. We also liked its outline-style hot lists and its excellent status messages. But none of this is enough to make the $49 Mosaic in a Box stand out from the crowd. The program may make sense if you're terrified by TCP/IP, or if you need Image View. Otherwise, we'd say look elsewhere. *Spry, CompuServe Internet Division, 800/557-9614* **Reader service no. 623**

NCSA Mosaic 2.009a

PROS: Good hot lists, free

CONS: Can't load graphics separately, no printed documentation

NCSA Mosaic's roots in the supercomputing arena still show: It's the only 32-bit browser we looked at, requiring the Win32s extensions to run. (You can download them when you download the browser.) But once it's up and running, Mosaic is a snap to use. It opens on NCSA's useful home page, comes with a preinstalled hot list, and lets you organize the list as menus.

Top 5 Newbie Sites

BY MARC ANDREESEN

1 Yahoo. An excellent directory of what's on the Web, organized by subject and continually updated. http://www.yahoo.com/

2 White House. A good example of how government organizations can communicate with ordinary citizens in cyberspace. http://www.whitehouse.gov/

3 Internet Town Hall. The "nonprofit radio station" of the Net, "dedicated to building public parks for the global village by adding to the core of public data, software, standards, and other widely available technology that makes the Internet work." Like, wow. http://www.town.hall.org/

4 Web Museum. Terrific representation of how cultural information can be presented on the Web. http://mistral.enst.fr/

5 Netscape's What's Cool. Sure, it's a shamelessly self-serving plug, but what a great page. http://home.mcom.com/home/whats-cool.html

Marc Andreesen is one of the founders of Netscape Communications Corp. and headed the NCSA programming team that developed the original Mosaic.

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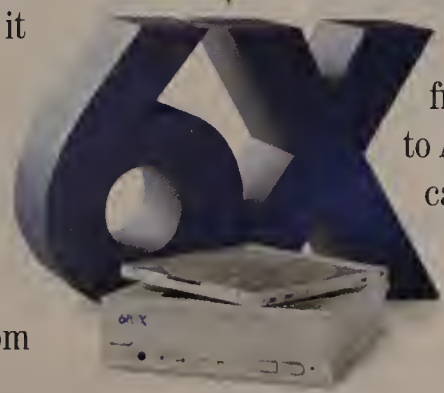

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NPR® CHANGED

If there is one thing we all have in common, it is a need to express ourselves. For some folks in Wyoming that need gets met every time they tune in to National Public Radio's® *The Thistle & Shamrock*® show, which airs Saturday evenings on Wyoming Public Radio. (That's 91.9 on your FM dial.)

Now aside from having a need to express themselves, NPR also has a rather urgent need to be heard. Which begins to explain why they're such keen users of Microsoft® Word 6.0.

You see, NPR is all about intelligent communication. So it stands to reason that they'd use an intelligent word processor. Especially if they were trying to do something like show the station that a Celtic music program could be the biggest thing to hit Chugwater since the blizzard of '69.

For such a job they'd surely want to add charts and graphs. They'd want to drag stuff from one document and drop it into another. They'd want automatic formatting. They'd want to whip up a table of contents. Simply put, they'd want to make their point so well that the station's staff would be happy to change their programming. And why shouldn't they be? NPR already knew how it would make their listeners feel.

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Of course we're not going to say Chugwater would have turned into a cultural wasteland if it weren't for *The Thistle & Shamrock* show. We're just saying that the more clearly you get your point across, the more likely it'll be heard. (Something to think about next time you're looking for a raise.)

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Circle 178 on reader service card

Performance is another matter: While Mosaic will download more than one page at a time, you have to open new instances of the program itself to do so (that's where the 32-bitness comes in). And Mosaic insists on downloading pages in their entirety (including the graphics) before displaying them or allowing further navigation. Given the sub-par performance, we'd advise you try try winWeb if you want a free browser; otherwise, try one of the commercial browsers. Use anonymous FTP to download Mosaic from **ftp. ncsa.uiuc.edu**, directory **/Mosaic/Windows**. *National Center for Supercomputing Applications, 217/244-3473*

NetCruiser Plus 1.52

PROS: Automatic configuration, full Internet suite, SHTTP security
CONS: Works with just one access provider, can't leave unfinished page

Like Mosaic in a Box, NetCruiser Plus completely automates the process of establishing an Internet connection and configuring your TCP/IP. And once you're signed up, the $44.95 package gives you a seamless, integrated front end to send and receive E-mail, read Usenet news groups, use FTP and Gopher, and even participate in Internet Relay Chat (IRC, the CB radio of the Net). All of these extra Internet tools are accessible via completely intuitive icons on a single toolbar.

But NetCruiser Plus has one fatal flaw: It only works on Netcom. Furthermore, its performance features are disappointing (it won't let you leave a page that hasn't finished loading) and it doesn't support third-party viewers. Unless Netcom is your only access option (its prices *are* competitive with other services), consider one of the faster and more flexible browsers instead. *Netcom On-Line Communications Services, 800/353-6600* **Reader service no. 624**

Top 5 Useless Sites

BY PAUL PHILLIPS

1. **WWW Dial Service. The Web as auto-dialer: "Select your desired number...and hold your handset near your terminal's speaker."** http://pluto.ulcc.ac.uk/Sound/dial. html
2. **The Page That Tells You How Many Times It's Been Accessed. And this is *all* that the page does.** http://pathos.mas.vcu.edu/cgi-bin/axe.pl
3. **Paul's Hot Tub Status. Good example of the Web's many "appliance pages."** http://hamjudo.com/cgi-bin/hottub
4. **Beard Research. Author shaved off half his facial hair and performed some very revealing tests.** http://mudhead.uottawa.ca/~pete/beard.html
5. **Statistics Concerning Joe Rumsey's Mouse. Number of button clicks (left and right) performed and distance traveled in feet and miles.** ftp://ftp.netcom.com /pub/og/ogre/mouse.html

Paul Phillips works as a developer for Primus Consulting and is curator of Useless Pages (http://www.primus.com/staff/paulp/useless.html)

Netscape Navigator 1.0

PROS: Top-notch performance, state-of-the art security, excellent navigation tools
CONS: None

According to a recent Web survey, more than 75 percent of those who access the Web use Netscape Navigator to do so. We understand why. Along with InternetWorks, Netscape Navigator is the best browser we looked at.

With a list price of $39 (free if you're willing to forgo tech support and documentation), price and performance are Navigator's two strongest suits. The program covers all the basics—downloading text before graphics; performing multiple, simultaneous down-

Warp Onto the Web

Taken on its own, IBM's WebExplorer for OS/2 Warp is a perfectly good little browser. But in the competitive world of similar tools for Windows, it's nothing special.

IBM does make WebExplorer easy to use. Setting up an account on IBM's own Global Network is a matter of simply pointing and clicking your way through the menus of the IBM Internet Dialer. However, if you can master the scripting language in the Dial Other Internet Providers section, you'll save money using a local provider. Once you're hooked up, you can download and install a copy of WebExplorer with the click of a single button. After that, you can customize fonts, colors, third-party viewers, and even caches.

Like most Windows browsers, WebExplorer takes advantage of several performance-enhancing tricks. It loads text and graphics separately, so you can start reading a page before the graphics arrive. You can move on to another link before the download is done, but you have to stop the first manually before you can proceed (other browsers stop the process automatically). Like the NCSA and Enhanced version of Mosaic, WebExplorer is a 32-bit application, which means you can maximize performance by opening multiple instances of the program.

WebExplorer supports caching, but it's not as smart about it as some other programs are: If you try to return to a page you stopped in the middle of a download, for example, it starts all over from the beginning; Netscape, for one, is smart enough to resume where it left off.

WebExplorer does make Web access easier for Warp users. And it helps Windows users, too, by lighting a fire under Microsoft's fanny to offer Web support in Windows 95. Use anonymous FTP to download a copy of IBM WebExplorer from ftp01.ny.us.ibm.net/pub/WebExplorer/web.zip.—Paul Hutmacher

Features Comparison

HOW'S YOUR BROWSER?

● = Yes ○ = No
n/a = not applicable

	Cello 1.01a	Enhanced Mosaic 2.0	Internet Chameleon 4.1	InternetWorks 1.0 [1]	Mosaic In a Box 1.0	NCSA Mosaic 2.009a
List price	free	[2]	$125	$49.95	$49	free
Setup						
Bundled with Windows TCP/IP stack	○	[2]	●	○	●	○
Automated sign-up with access provider(s)	○	[2]	●	○	●	○
Configuration scripts for provider(s)	○	○	●	○	○	○
16-bit or 32-bit application	16	32	16	16	16	32
Customizable cache size/colors	●/●	●/●	○/●	●/●	●/●	●/●
Local help files format	Windows HLP	[2]	Windows HLP, HTML	Windows HLP	Windows HLP	n/a
Includes printed documentation	○	[2]	●	●	●	○
Navigation and performance						
Downloads more than a page at a time	○	●	○	●	○	●
Download progress report	bytes received	thermometer	○	bytes received, thermometer	percentage	bytes received, percentage
Hot lists	●	●	●	●	●	●
Includes preinstalled hot list	●	○	●	●	●	●
Multiple hot lists	●	○	●	●	●	●
Organizes hot list into folders or sections	●	○	○	●	●	●
Method of adding current page to hot list	button	button, menu	button, menu	dragging and dropping	button, menu	button, menu
History log	●	●	●	●	●	●
Remembers history log between sessions	○	●	●	●	○	○
Other features						
Accepts third-party viewers	●	[2]	●	●	●	○
Security	basic authentication	basic authentication, private key encryption, SHTTP	basic authentication	basic authentication	basic authentication	basic authentication
Other Internet tools	FTP, Gopher, news reader, E-mail send, Archie, Jughead, Veronica, WAIS	FTP, Gopher	FTP, Gopher, news reader, E-mail send/receive, telnet, Archie, WAIS	FTP, Gopher, news reader, E-mail send/receive, telnet, Archie, Jughead, Veronica, WAIS	FTP, Gopher, news reader, E-mail send/receive, telnet, Archie, Jughead, Veronica, WAIS	FTP, Gopher, news reader, E-mail send, Archie

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[6] Proprietary TCP/IP.

loads; caching—and then does them one better. If you've turned graphics off (to speed things up) but then want to see a page in full, a button on the toolbar will reload the page with graphics. It loads graphics in eight sequential renderings, so you can preview images as well as text. It uses both memory and disk caching and can cache pages from previous sessions.

Netscape Navigator also offers more security than most other browsers. In addition to supporting Netscape's own Secure Sockets Layer scheme (which more and more Web pages support), Navigator is the only browser that warned us that our data wasn't secure before we transmitted online forms. The toolbars, menus, and status information are all exemplary. Our only quibble: Navigator gave us less control over the fonts in its page display than did any other browser. Beyond that, we found nothing to dislike about Netscape Navigator, and very much to like. For our money, this is the best stand-alone browser you can buy. *Netscape Communications Corp., 415/528-2555* **Reader service no. 625**

SuperHighway Access for Windows

PROS: Good graphics viewers
CONS: So-so performance

WinTapestry 4.0, the browser in Frontier's $125 SuperHighway Access for Windows, looks a lot like InternetWorks: Both programs use a card catalog instead of a hot list, and both eschew the tradi-

NetCruiser Plus 1.52	Netscape Navigator 1.0	SuperHighway Access for Windows	winWeb 1.0 A2.3
$44.95 [3]	$39 [4]	$125	free [5]
● [6]	○	●	○
●	○	○	○
○	○	●	○
16	16	16	16
○/●	○/●	○ [7]/●	○/●
Windows HLP	n/a	Windows HLP	n/a
●	●	●	● [8]
●	●	●	○
bytes received, percentage, thermometer	bytes received, thermometer	bytes received, percentage, thermometer	thermometer
●	●	●	●
○	○	●	○
●	●	●	○
○	●	●	○
menu	menu, hot key	button, menu, dragging and dropping	button
●	●	●	●
○	○	○	○
○	●	●	●
basic authentication, SHTTP	basic authentication, SSL	basic authentication	basic authentication, DES encryption
FTP, Gopher, news reader, E-mail send/ receive, telnet, Veronica	FTP, Gopher, news reader, E-mail send, Archie	FTP, Gopher, news reader, E-mail send/receive, telnet, Archie, Jughead, Veronica, WAIS	FTP, Gopher, news reader

[7] Depends on disk space.

[8] Commercial version only.

tional history list; while InternetWorks adds a notebook tab for every page you've visited, WinTapestry puts an icon on the toolbar.

But WinTapestry misses some of the performance tricks that make InternetWorks more attractive. While you can tell it to delay the display of graphics (by default, it won't display a page until text and graphics have been received), it won't let you navigate further until the text and graphics are both on screen. Also, WinTapestry doesn't let you adjust the size of the cache, and you can't cache documents from previous sessions.

When it comes to viewing a Web page, WinTapestry supports more graphics formats than the other browsers we looked at. (It also lets you use third-party viewers.) Like Internet Chameleon, InternetWorks, and NetCruiser Plus, SuperHighway Access gives

WINWEB USES A POP-UP THERMOMETER to show you how much longer a download will take.

you tools for E-mail, news groups, and FTP (Gopher is supported in the browser itself). In short, WinTapestry does everything you want a browser to do. Unfortunately, it doesn't do it as well as InternetWorks. *Frontier Technologies Corporation, 800/929-3054*

Reader service no. 626

winWeb 1.0 A2.3

PROS: Great home page, free

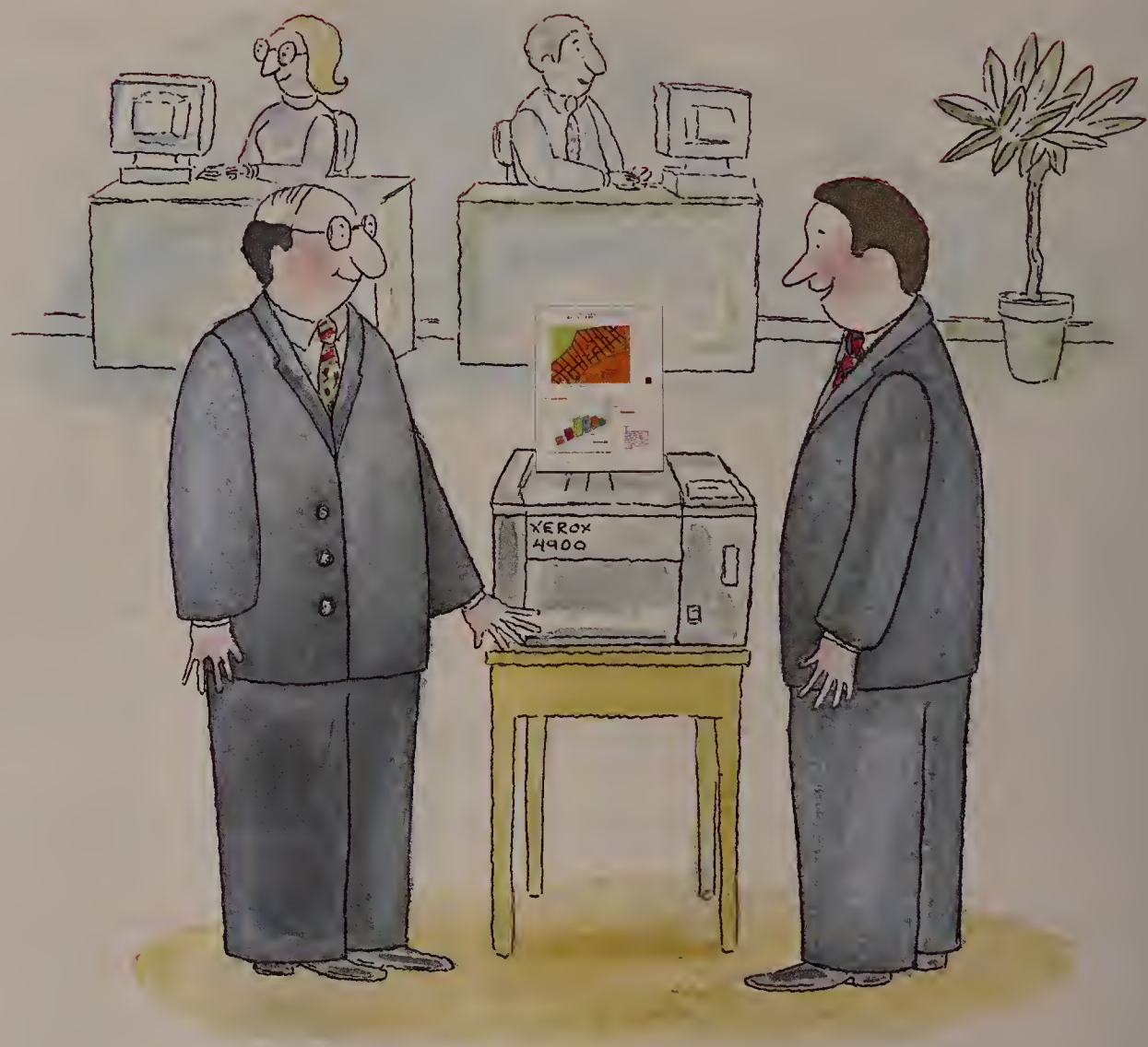
CONS: Could do more to enhance performance, no printed documentation

Of the three freeware browsers we looked at, winWeb feels the most polished. In fact, the program is also sold as shareware: For $38 you get the browser plus printed documentation and customer support. In other respects, the freeware winWeb we reviewed is identical to the shareware version.

Like most browsers, winWeb doesn't come with its own TCP/IP stack; it assumes you already have one. If you do, winWeb is ready to go. Once you're up and running, winWeb opens by default on EINet's excellent home page, which contains a comprehensive index of Web sites. You can navigate from there using the myriad links, as well as the hot list (which has a handy 'Add current page' button) or the back-to-basics toolbar. WinWeb takes advantage of caching to maximize performance, but won't let you leave a page until it's fully loaded, and you can't download more than one page at a time. While pages download, winWeb gives you useful, thermometer-style status reports, and it's nice enough to tell you that it's 'Loading X of Y images.'

Like other freeware browsers, winWeb doesn't come with any printed documentation, but frankly, we didn't miss it. We were too busy cruising the Web, happily oblivious to which browser we happened to be using—perhaps the highest compliment we could pay a freeware program. While winWeb can't compete with Netscape or InternetWorks on features, for the price it can't be beat. Use anonymous FTP to download winWeb from **ftp://einet.net/einet/pc/winweb/winweb/zip**. *EINet, 800/844-4638*

When winning business means big bucks, count on the Xerox 4900 Color Laser Printer.



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Sure, other printers can give you color. But do they give you a competitive advantage? The unmatched image quality of the Xerox 4900 Color Laser Printer will startle your prospects, pull in new business, and make your ideas memorable. Quad-dot technology brings your documents to life; high speeds for both color and B&W printing quickly get your proposals off the network, out of the printer, and into your clients' hands. An affordable printer that keeps you a step ahead, a cut above your competition ... and backed by our three-year Total Satisfaction Guarantee, to boot. So call us today at 1-800-34-XEROX, Ext. 101. Put more power in your sale.

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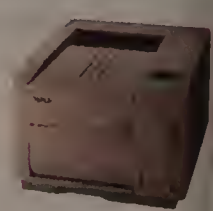
12/3 ppm

1200 x 300 dpi

Adobe PostScript Level 2



THE DOCUMENT COMPANY

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Circle 191 on reader service card

BEST

Battle of the Megaservices: America Online, CompuServe, Prodigy, Delphi, and GEnie.

Online Services

BY JUDY HEIM

STEVEN LYONS

Could the Internet render online services obsolete? Not by a long shot. While the Internet may have more information stores and databases than commercial online services, actually using it is still a daunting task. Nevertheless, the Internet's popularity has forced online services to clean up their acts. The result: Online services are offering business and consumer users more bang for their buck than ever before.

Business users can enjoy new information resources such as *Investor's Business Daily* on America Online, *Fortune* on CompuServe, and PC World Online on both services. For fun, you'll find splashy graphics, celebrity appearances, downloadable sound and movie clips, and electronic versions of *People*, *Spin*, *Sports Illustrated*, and hundreds of other magazines.

Online services can get you to the Net, too. Prodigy was the first to offer a graphical World Wide Web browser; CompuServe followed; America Online promises Web access by the time you read this. Surfing the Net via an online service eliminates the hassle of configuring your software, as is required by Internet-only packages such as

Spry's Internet in a Box. But online services don't offer as complete a set of access tools as you'll find in the Internet-only packages.

This review takes a close look at the market-leading online services—America Online (AOL), CompuServe, Delphi Internet, GEnie, and Prodigy—and previews some of the most promising up-and-coming services in "Down the Wire." We evaluate each service on a wide range of features, from the quality and diversity of information offered to ease of use and pricing. To assess ease of use, we sent an E-mail message with a file attachment, read and replied to message threads in public forums, searched for and downloaded PKZip, and found and saved information on mutual funds. All told, we discovered that not all the services are as accessible as they're cracked up to be. (See our "Usability Report Card.")

Not Just Fun and Games

Online services are one-stop information shops. All provide access to a wide range of company, financial, and market research databases, stock quotes, investment advice, and news. The business information the services offer actually surpasses what you'll find on the Net. Despite all the hullabaloo about business topics springing up on the Net, the majority of databases there are academic in nature.

And the user interface? AOL's and CompuServe's splashy front ends help you find just what you want. At press time, Delphi Internet, GEnie, and Prodigy were planning major facelifts.

What's more, all let you send and receive E-mail to anyone with an Internet address. All support 14.4-kbps access; AOL, CompuServe, and Prodigy offer limited 28.8-kbps service. You can take advantage of money-saving offline features to automate message and file retrieval.

Making Connections

Meeting people is a compelling reason to go online. While Internet etiquette dictates that you not clutter cyberspace with idle chitchat, online services encourage you to gab. A strong sense of community develops in many forums as users find people—not hulking databases—to be their best information sources.

Online services are growing by leaps and bounds. In this exciting time, however, some are evolving more successfully than others. Read on for more specifics about what each service has to offer. While none is flawless, we're sure you'll find one that's right for you.

Judy Heim is a contributing editor for PC World.

For more information about all services in this article, circle reader service no. 915.

Best Buys

CompuServe is the best research tool for the business user. You can be on and off in minutes, E-mail and needed information in hand. A cornucopia of business databases and tech support from hundreds of vendors makes it the top online source for information. You also get solid Internet access, although not all Internet features are available.

CompuServe

America Online

For home users, America Online is number one. A wide range of special forums, ranging from *Scientific American's* to MTV's, will keep you entertained while daily news and consumer updates keep you well informed. Best of all, the hourly charges cover most of the services available, so you do not have to worry about incurring additional expenses—a terrific plus, considering the amount of time AOL's offerings will tempt you to spend online.

America Online

PROS: Low cost; attractive, easy-to-use interface; no extra charge for sending E-mail or files; good balance of recreational features, news, information, and Internet access tools

CONS: Slow; inability to automate message retrieval from forums can drive up costs; no quick way to store E-mail; limited business information; Internet access tools don't always work well

NEWS AND PUBLICATIONS: You'll find headline stories from the *New York Times*, the *Chicago Tribune*, and Reuters, plus sports scores, newsmagazines like *Time* and *Business Week*, and news broadcasts from ABC, NBC, National Public Radio, and others. An eclectic roster of over 50 glossy magazines, ranging from *Atlantic Monthly* to *Spin*, present their latest stories online.

BUSINESS AND FINANCIAL INFORMATION: Business-oriented databases are spare, although you do get free stock quotes, which you can track in an online portfolio. Small investors can refer to the indispensable *Investor's Business Daily*, the *Morningstar Mutual Fund* reports, and a forum run by the American Association of Independent Investors.

HARDWARE AND SOFTWARE SUPPORT AND INFORMATION: A few major hardware vendors—including Dell, Compaq, Acer, Gateway, and Intel—run support forums. Software support is limited.

SPECIAL INTEREST RESOURCES: The wide variety of family conferences and forums—including MTV Online, The Discovery Channel, Court TV, a trivia forum, and many others—will appeal to everyone in the household. And AOL's software library is second only to CompuServe's.

INTERNET ACCESS: AOL offers Internet E-mail, most Usenet news groups, mailing lists, FTP (file transfer protocol), WAIS (Wide Area Information Server) and gopher databases, and the Veronica search tool. NaviSoft's InternetWorks Web browser should be integrated into the service by the time you read this. While all of AOL's Internet offerings are easy to figure out, our informal testing revealed that large files occasionally arrive cut short, and retrieving files can take much longer than it does on CompuServe. Also, AOL doesn't keep up with name changes in news groups; when a news group's name changes, it may be inaccessible for months.

INTERFACE: AOL 2.0 for Windows looks great. Clearly labeled buttons on the main menu make navigation easy. As you progress through the service, colorful icons and graphics make your online experience a pleasure.

USABILITY: AOL is the most user-friendly service we reviewed. However, it can be slow when it's updating graphics, retrieving messages from forums, and downloading files from the Internet. There's also no way to automate message retrieval from forums.

HOT SPOTS ON AOL: Head to the ABC News Your Money, Your Choice database to read shocking accounts of how the government is wasting your tax dollars. Once you're there, click on the *Library* icon and look for Your Money in the list of choices. Vets, trainers, and breeders answer questions in the Pet Care Forum.

CONNECTION INFORMATION: $9.95 a month for 5 hours online, $2.95 per hour thereafter. CompuServe allows users to choose up to five separate screen names with unique passwords. *America Online, 800/827-6364.* **Reader service no. 805**

CompuServe

PROS: Fast, glitch-free access; active membership shares lots of valuable information online; many business-related databases; plentiful computer information and support.

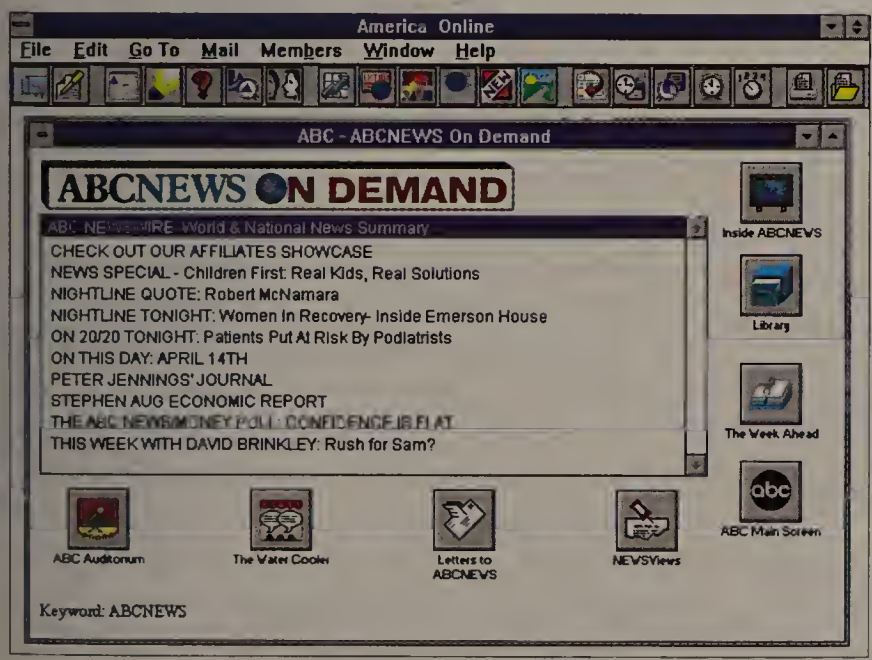
CONS: Most offerings cost extra—business databases are especially pricey; conferences on specific subjects can be hard to find; forum messages are removed after a few days.

NEWS AND PUBLICATIONS: CompuServe is the best of the bunch when it comes to current and archival news. For daily news, you can read Associated Press stories at no hourly charge. For insight into events, you can search 55 big-city newspapers as well as databases listing stories from hundreds of consumer and business publications.

BUSINESS AND FINANCIAL INFORMATION: CompuServe offers access (at a cost) to the incredible Dialog databases covering subjects from medicine to marketing, plus TRW credit reports, Dun & Bradstreet marketing databases, Citicorp's company information service, and more. For small investors, there are free stock quotes and free access to *Money* magazine's superb mutual-fund database.

HARDWARE AND SOFTWARE SUPPORT AND INFORMATION: CompuServe has over 850 vendors online, from Hewlett-Packard to Lotus to Microsoft, offering generally excellent technical advice. Computer Database Plus offers product reviews from computer magazines.

SPECIAL INTEREST RESOURCES: You'll find everything from war simulation games to Roger Ebert online. In CompuServe's 900 different public forums, you'll meet more people doling out more good advice than on any other service. CompuServe particularly excels in its shareware offerings, available in most hardware and software forums.



News junkies will enjoy America Online's low-cost daily news stories, plus stories from the many magazines and broadcasters online.

Matthew Lesko's Government Giveaways Forum on CompuServe tells you how to get free money and advice from Uncle Sam.

INTERNET ACCESS: CompuServe lets you send and receive Internet E-mail, subscribe to most news groups, log onto remote computers via telnet, and download files with FTP. CompuServe also offers Spry's AirMosaic integrated Web browser and the ability to use the CompuServe network with any third-party Web browser. The Internet feature is not especially easy to use—you need to know what you're looking for before you start—but it is simpler than what you get on Delphi. Our informal testing revealed that obtaining files from the Internet, as well as reading news groups, is considerably faster and more foolproof than through America Online.

INTERFACE: CompuServe Information Manager 1.3 for Windows (WinCIM) is second only to AOL in looks. An OS/2 version is available, and version 1.4 should be available by the time you read this. With WinCIM, you click on self-explanatory icons to navigate the service. Sometimes WinCIM throws you into an unattractive terminal emulation mode to search databases, however. Other high-quality front-end programs for automating access, ranging from The Support Group's TAPCIS to Ozark Software's OzCIS, can speed up your online experience and shave dollars off your bill.

USABILITY: CompuServe is the top business productivity tool here, because its offline features and fast file downloading let you get on and off fast. However, our usability tasks revealed that the service's organization can be confusing. Ironically, the file finder feature is hard to find and doesn't search all files on the service.

HOT SPOTS ON COMPUSERVE: Try the Information Please Business Almanac for quick access to business statistics and information, Matthew Lesko's Government Giveaways Forum, or discussions of the day's news in CNN Online.

CONNECTION INFORMATION: $9.95 per month for unlimited access to news services and a smattering of consumer databases, then $4.80 per hour for most other services. Internet access is $2.50 per hour, or $15 for 20 hours per month. Extra fees for heavy E-mail use and for access to many databases. Incoming and outgoing Internet E-mail messages cost 10 cents apiece. *CompuServe, Inc., 800/848-8199.* **Reader service no. 806**

Delphi Internet

PROS: Friendly, chatty atmosphere; low evening rates on 20/20 Advantage Plan; member-created forums; most complete Internet access.

CONS: Difficult to use; limited business information; poor file libraries; Internet access difficult to use and sometimes unreliable; exorbitant daytime rates.

NEWS AND PUBLICATIONS: Delphi's news offerings are limited; it provides just UPI and Reuters.

BUSINESS AND FINANCIAL INFORMATION: Delphi's resources here are also rather limited. Much of what you do get—including reports on bonds, CDs, money funds, and stocks—costs extra. Stock quotes cost 7 cents each, and you get closing prices only.

HARDWARE AND SOFTWARE SUPPORT AND INFORMATION: Most computer conferences are for older computers (Apple II, Tandy, Amiga, Commodore) and programming languages.

SPECIAL INTEREST RESOURCES: Delphi is the only major online service that lets users organize their own public forums on any topic ($28 per month). Your forum's menu can include software libraries and direct links to Internet sites containing related information. The free software and shareware collections aren't huge, but downloading is fast (and cheap, so long as you call at night).

INTERNET ACCESS: Delphi offers more Internet tools than any other service. You can send and receive E-mail, read news groups, download files using FTP, log on to remote computers using telnet, or search for information on gopher and WAIS databases with utilities such as Archie and Veronica. Internet relay chat lets you have live conversations over the Net, and the finger utility helps you find individuals' E-mail addresses. Too bad using Delphi's Internet link is about as pleasant as chewing tinfoil. Not only must you know exactly what commands to type, but the response time is very slow. Our many efforts to retrieve files using FTP and to log on to gopher servers have been unsuccessful as well. Delphi's current Web browser doesn't support graphics.

INTERFACE: Ugh! Aside from a few navigational buttons provided by the InterNav 1.1 interface, Delphi sticks you with dreary menus written in dreary ASCII text. Trying to figure out an acceptable response to nearly every prompt is a challenge to the intellect. At press time, Delphi was working on a new graphical interface scheduled to ship this summer and had announced a deal to incorporate a customized version of the Netscape Navigator Web browser into the service. In the meantime, the best way to access Delphi is with the shareware automation programs D-Lite and Rainbow, both available for downloading on Delphi.

USABILITY: Finding what you want can be virtually impossible, following message threads in forums is tough, and the lack of a central file library or file finder makes searching for software highly unpleasant.

HOT SPOTS ON DELPHI: Callahan's Saloon is like an electronic Cheers, where users spill out their troubles in frothy public messages. In the Writer's Group, denizens discuss the joys of publishing and the agonies of being edited. Choose Groups and Clubs off the main menu to find either of these forums. There is a conference for larger-size women called "Statuesque and Reubenesque" and there are many conferences for discussing the differences between the sexes.

Down the Wire

AOL, CompuServe, and Prodigy are the online market leaders today. But soon you'll have even more services to choose from. Here's a look at some of the most promising newcomers.

THE FRONT-RUNNER

The Microsoft Network (MSN) is scheduled to ship as part of Windows 95 in August. However, the Department of Justice is investigating Microsoft for possible antitrust violations; some industry insiders question whether Microsoft will be allowed to bundle MSN with its operating system.

Whatever the final outcome of the investigation, MSN promises lots of valuable content, including forums for more than 50 hardware and software vendors such as Dell, Gateway, and Lotus. MSN will also support links to applications—for example, clicking on a button in Excel brings you straight to the Microsoft Excel technical support forum.

MSN will offer E-mail and news groups at launch and will add a customized version of Spyglass's Mosaic Web browser, gopher, and FTP by the end of the year. Basic monthly charges may be as low as $4 to $5 per month, according to Microsoft. Most services will have surcharges, however.

AT&T'S TWO-PRONGED ATTACK

AT&T's Interchange should be online by the time you read this. It will offer a collection of information services, including the *Washington Post, Cowles Business Media,* and others. Hypertext links will take you to related databases and information. Pricing has yet to be set.

AT&T's PersonaLink is designed especially for personal communicators, such as the Sony MagicLink, but a Windows version should be available later this year. For $9.95 a month, PersonaLink users can tap into a limited version of Lexis/Nexis, Internet E-mail, online shopping, and news. They can also set up special programs to filter incoming E-mail.

APPLE PIPES UP

eWorld debuted on the Mac, but should be available on Windows later this year. It's organized around a town square motif in which users click on the Arts Pavilion or the Business Plaza to get to information. It costs $8.95 per month for 4 hours online, and $2.95 per hour thereafter.

Apple Computer's eWorld, 800/775-4556
Reader service no. 810

AT&T's Interchange, 617/252-5477
Reader service no. 811

AT&T's PersonaLink, 800/936-5465
Reader service no. 812

The Microsoft Network, 206/882-8080
Reader service no. 813

—Anita Hamilton and Judy Heim

CONNECTION INFORMATION: The 10/4 Plan is $10 per month for 4 hours of evening access, then $4 for each additional hour. The 20/20 Advantage Plan costs $19 to enroll, plus $20 per month for 20 hours of evening access and $1.80 for each additional hour. Internet access, including Internet E-mail, is $3 per month extra. Daytime use costs $9 per hour extra. *Delphi Internet Services, 800/695-4005.* **Reader service no. 807**

GEnie

PROS: Lots of hobby-oriented and recreational public conferences.

CONS: Horrible interface; slow file transfers; little business information; skimpy libraries; poor Internet access; surcharges for daytime use and 9600-bps access; limited 14.4-kbps access.

NEWS AND PUBLICATIONS: Daily news is limited to Reuters stories. You can access back issues of major newspapers through Dialog, but at $4.50 per search plus $4.50 for each article you read, it's cheaper to drive to the public library—or sign up for America Online, which offers access to the *New York Times* for free.

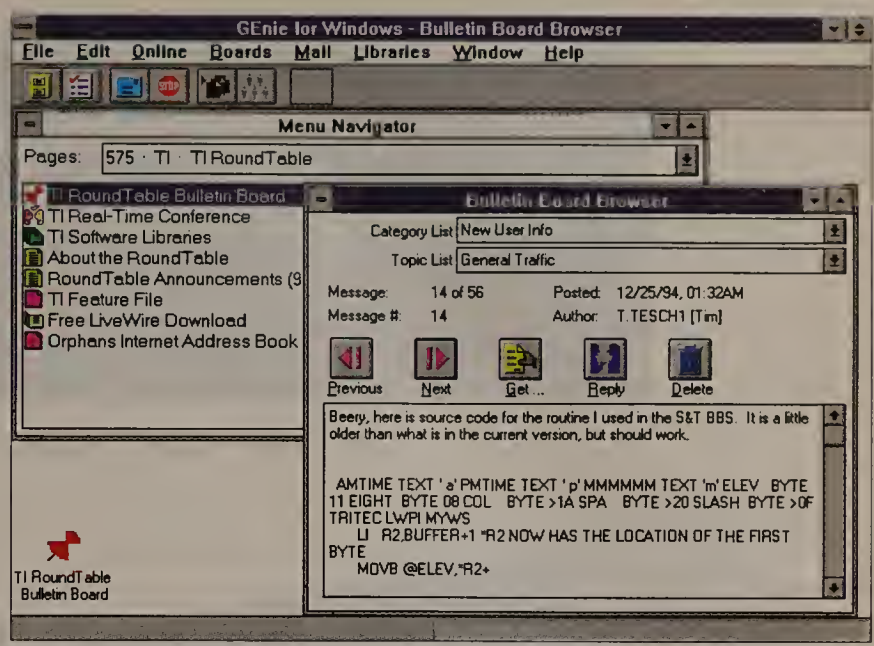
BUSINESS AND FINANCIAL INFORMATION: Slim pickings, but you can tap into Dow Jones News/Retrieval, the Official Airline Guides, and Dun & Bradstreet company profiles. The Charles Schwab brokerage is online, and end-of-day stock quotes are also available.

HARDWARE AND SOFTWARE SUPPORT AND INFORMATION: Microsoft, Borland, Novell's WordPerfect division, and Hayes Microcomputer are here, but that's about it for big-name vendors. GEnie is a good place, though, to head for tech support for Atari, Commodore, pre-Macintosh Apples, and other old computers.

SPECIAL INTEREST RESOURCES: GEnie has lively hobby, science fiction, and game forums.

INTERNET ACCESS: GEnie has E-mail access. GEnie also advertises Usenet, FTP, and gopher access, but we had little success getting these services to work.

INTERFACE: Although GEnie promises a completely new interface by the time you read this, the Windows front end we reviewed (version 1.2) offers little beyond a gaggle of inexplicable icons. To navigate the service, GEnie throws you into a medieval terminal interface, where you wrestle with obscure commands, scowl while waiting for menus to appear, and clench your teeth as dialog boxes pop up with Alice-in-Wonderland error messages, such as 'GEnie Error 124 encountered, File=SFL:TEMPUPLD, Please report'. Saving messages and information is nearly impossible. Hard-core GEnie users prefer the free DOS-based Aladdin front-end software to automate sending and retrieving messages from conferences. Type **aladdin** at any prompt to download. A new interface, due out by the time you read this, may improve GEnie's image.

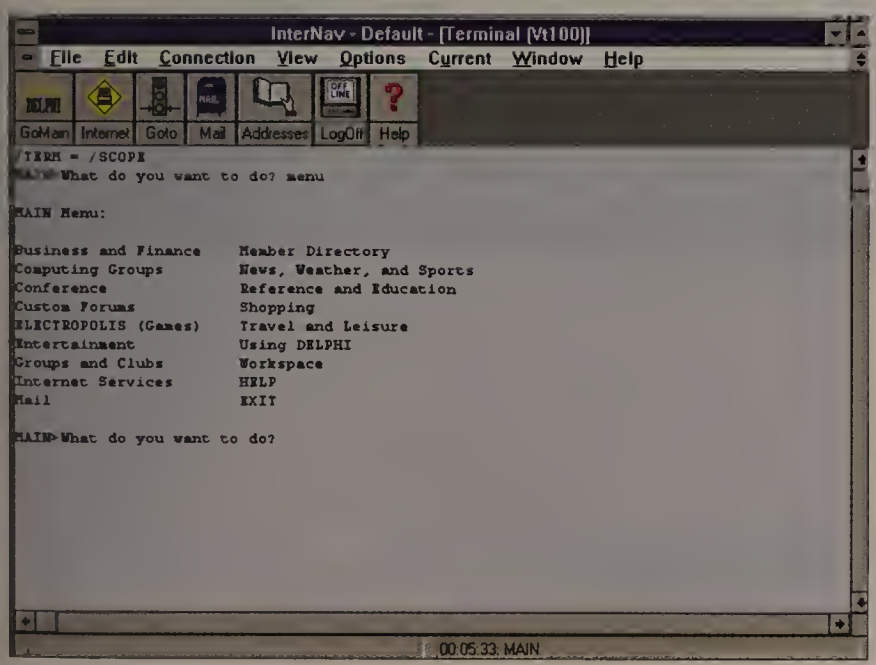


GEnie is a good place to talk about old computers and swap source code for the Texas Instruments TI-99, but that's about it.

USABILITY: GEnie has for years inflicted upon the online world some of the most tortuous user interfaces ever to materialize on screen. It's hard to do anything—from finding specific forums to uploading E-mail or searching for software—in under 30 minutes.

HOT SPOTS ON GENIE: The Small Business and Home Office Roundtable is the best public conference of its kind, while the Investor's Roundtable offers candid opinions on funds and investments.

CONNECTION INFORMATION: $8.95 per month for 4 hours of night and weekend connect time, $3 per hour thereafter for nighttime use, $2 per hour additional surcharge for daytime use, $6 per hour surcharge for 9600-bps connections. Additional fees for some services. Users of the Windows or Aladdin front ends can connect only at 9600 bps or slower. Those connecting to GEnie with a data communications program may be able to do so at 14.4 kbps via SprintNet. *GEnie, 800/638-9636.* **Reader service no. 808**



Using Delphi is a lot like calling a computer bulletin board. You type in commands, and all the information is organized around forums.

Prodigy

PROS: Friendly online environment; lively recreation forums; good Web browser; household accounts; best service for kids.

CONS: Superficial content; slow screen updates; numerous extra charges; public messages disappear after a couple weeks; no software library; ads at bottom of screens.

NEWS AND PUBLICATIONS: Prodigy's daily news includes Associated Press stories and top stories from several regional newspapers. *Newsweek* fans can check out Newsweek InterActive. Other publications carried online include *Kiplinger's Personal Finance Magazine, Ad Age, Consumer Reports,* and *Sports Illustrated for Kids.*

The computer to have when your next mission feels absolutely impossible.

The IBM PC 700

IBM PC Direct prices and offerings are subject to availability or withdrawal. Prices/offerings in Canada may vary. Remarketer prices vary. Shipping and handling charges are extra. *Assembled in the U.S. U.S. and non-U.S. components. ** When referring to hard drive capacity, MB = one million bytes; accessible capacity varies. †Requires modem. †† Please call 1 800 426-7255 for details on IBM's money-ba guarantee and limited warranty. Copies of limited warranty available upon request. 1. 1995 EquiTrend Survey of perceived quality. 2. IBM Credit Lease prices are quoted for 36-month terms. Lease rates quot

The IBM PC 700* was designed to tame your worst mission-critical PC nightmares. A task that requires lots of power. Like a 90MHz Pentium™ processor, an Enhanced IDE 540MB** hard drive, along with a PCI local bus featuring 64-bit graphics capability. Now, dream about network control like you've never seen before. Remotely monitor system information (even see which operating systems and applications are running) with NetFinity.™ Also, EasyTools software gives you extensive management diagnostics, plus connection to the IBM support center.† IBM offers a broad range of models with Pentium processors, a powerful solution for mission-critical applications and complex, networked environments. Now, you can have all that high power and control at a low price, from IBM PC Direct.™ And of course, our 3-year limited warranty†† comes with toll-free voice support 24 hours a day, 7 days a week (excluding some holidays). So, if your next mission looks pretty impossible, call the team at IBM PC Direct. We're ready to take orders.

Tech heads get all pumped up about the Pentium 90MHz Processor and SelectaBus™ PCI/ISA architecture.

Monitoring a network has never been easier. With NetFinity,™ you've got things under control.

Let's talk nuts & bolts. Survey shows consumers rate IBM high on quality.[1]

Listen to this! 16-bit business audio standard, with microphone and headphone jacks right up front.

The IBM PC 700 at a glance

This PC 700 includes

- Pentium 90MHz processor
- 8MB RAM w/256KB L2 cache
- 15" color monitor with a maximum diagonal viewable screen size of 13.7"
- 540MB** Enhanced IDE hard drive
- 3 slots/3 bays
- SelectaBus™ PCI/ISA architecture
- SVGA PCI local bus graphics with 1MB VRAM, upgradable to 2MB
- 16-bit Business Audio Standard
- Hookup for optional CD-ROM

For HelpWare service and support

- EasyTools Software – advanced diagnostics connection to the IBM support center asset/system management with NetFinity and vital product data.
- QA Plus† – enables users and systems support staff to diagnose problems with the system board, hard drive, diskettes, memory, keyboards, etc.
- NetFinity™ – allows remote gathering of systems configuration details.
- Co-Session Remote Control† – allows administrator to remotely connect with user systems.
- 3-year limited warranty††
- 30-day money-back guarantee from IBM PC Direct††
- Toll-free voice support, 24 hours a day, 7 days a week (excluding some holidays).
- Problem determination, setup and usage assistance for hardware and pre-installed DOS, Windows or OS/2.

Call us, we're open 8am–10pm Monday–Friday, 9am–5pm Saturday (Eastern Time).

IBM Credit Lease $105/mo[2]

$2,974

(Price does not include monitor stand as shown.)

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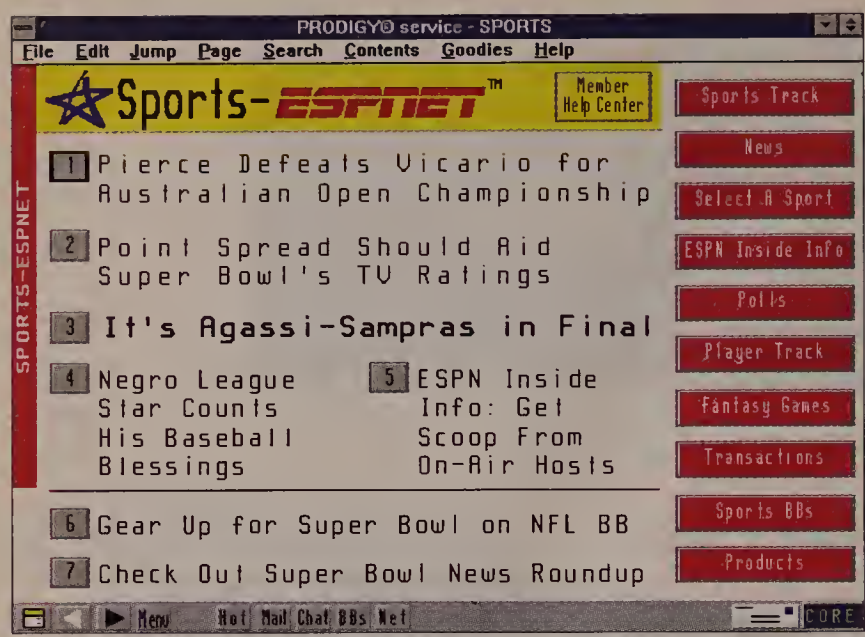


Entertainment features like ESPNet sports news are Prodigy hallmarks. Here you can track statistics on players and teams.

BUSINESS AND FINANCIAL INFORMATION: Prodigy offers a fair selection of information for small investors, including stock quotes, stories from *Kiplinger's*, and CNBC market reports. You can use the Stock Hunter feature to look for stocks via sophisticated search stratagems, and Strategic Investor to chart pricing data on companies you specify. Wall St. Edge offers a daily selection of stock tips drawn from insider's newsletters. Too bad these tips cost an additional $14.95 per month.

HARDWARE AND SOFTWARE SUPPORT AND INFORMATION: The only major vendors that offer free support on Prodigy are Acer, Dell, and Leading Edge. Prodigy hopes that you'll tap into ZiffNet instead for support, at a princely $7.50 per month (for one hour) plus $7.80 per hour thereafter. Prodigy also hopes that you'll go there to download drivers and utilities. Otherwise, it has no file libraries.

SPECIAL INTEREST RESOURCES: Prodigy's sports coverage is exceptional, offering regularly updated scores of games in progress. You'll also find a steady stream of celebrities online. A new Homework Helper feature designed for kids contains a lot of useful reference information, but it costs $9.95 per month extra (for two hours). Parents can block their children's access to specific areas of the service or to the Internet.

INTERNET ACCESS: Prodigy offers Internet E-mail, access to most news groups, and its own Web browser. You can also obtain files with FTP and gopher via the Web browser. Reading news group messages is a slow process. Prodigy's Web browser is well designed, and its home page offers helpful pointers to many Web pages, but the browser runs slowly.

INTERFACE: Prodigy is planning a major redesign of its interface with the launch of P2, due out by the time you read this. For now, however, Prodigy's clownish screens and oversized letters get old fast, as do the ads at the bottom of most screens, and the slow screen updates in version 1.1 for Windows.

USABILITY: Prodigy was once childishly simple to use, but it's become a labyrinth over the years as it has tacked on more features. While you can automate retrieval of private E-mail, there's no way to automate the sending and reading of mail in public conferences. Saving messages is laborious at best.

HOT SPOTS ON PRODIGY: In ESPNet and the NFL Online Fan Club BBS you'll find coaches and players online, game schedules, player statistics, sports columns, and lots of good talk. The Money Talk Bulletin Board offers good advice and conversation on personal investing. And don't miss the Web browser.

CONNECTION INFORMATION: $9.95 per month includes 5 hours of connect time, then it's $2.95 an hour thereafter. Many areas cost extra. Each account allows up to six users with separate IDs and passwords. *Prodigy Services, 800/776-3449.* **Reader service no. 809**

Usability Report Card

AOL IS THE EASE-OF-USE LEADER

Task	America Online	CompuServe	Delphi Internet	GEnie	Prodigy
Sending E-mail with a 160K file attachment	B–	A	C–	D–	C
Time/price at 9.6 kbps[1]	4:50/$.24	13:00/$.23	15:17/$1.02[2]	14:45/$1.23[3]	9:30/$1.65
Time/price at 14.4 kbps[1]	3:04/$.15	2:34/$.23	5:14/$.35[4]	15:46/$1.31[3,5]	7:40/$.38
Reading, replying to, and storing messages in forums	B+	A	D	D+	C+
Searching for information on mutual funds	A	B–	C	C–	B+
Searching for and downloading PKZip	A	C	C–	F	D
Overall	A–	B+	C–	D	C
Comments	Easy to use, but its offline features could be faster.	Organization can be a little confusing.	We had problems with every task.	Using Windows front end can be trying.	Interface isn't as easy to use as it looks.

BEST BUY

[1] Calculated using each service's hourly fee, plus per-character charges if applicable.

[2] Evening transmission with 10/4 plan. $.46 with 20/20 Advantage Plan.

[3] Via SprintNet nodes. Otherwise, prices are higher.

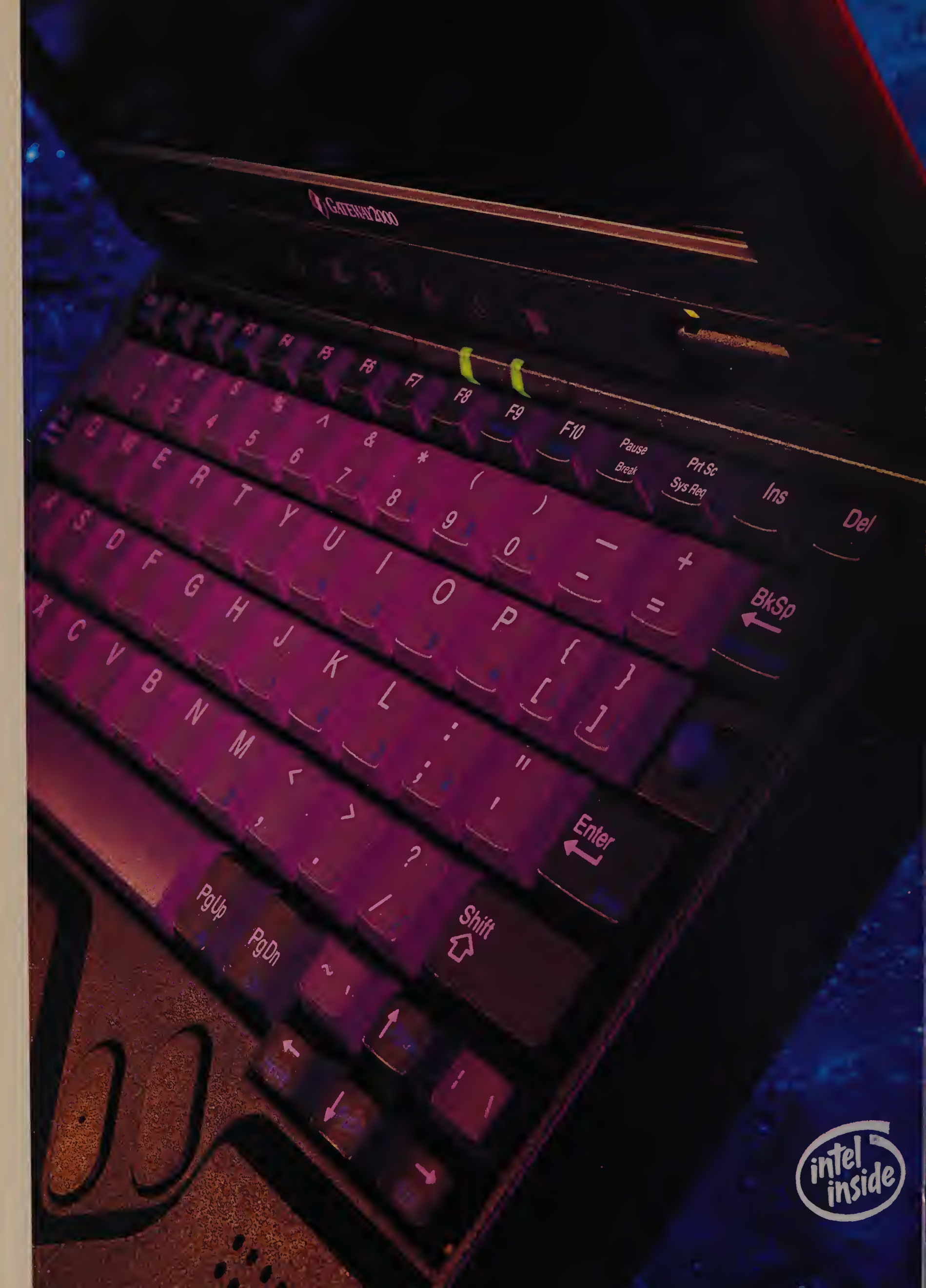
[4] Evening transmission with 10/4 plan. $.16 with 20/20 Advantage Plan.

[5] At press time, 14.4-kbps connections available only via SprintNet.

THE COLD HARD FACTS

GATEWAY2000

GATEWAY2000
LIBERTY


GATEWAY 2000
F6
F7
F8
F9
F10
Pause
Break
Prt Sc
Sys Req
Ins
Del
BkSp
Enter
Shift
PgUp
PgDn
intel inside

CLEAR-CUT ANSWERS

Your choice of a portable PC may not seem like a crystal clear decision at first. There are about a gazillion portables to choose from. Want some clear-cut answers to what's right for you?

Gateway 2000® offers quality portables with performance and features that'll thrill you to chills. But whether or not a Gateway Liberty™ or ColorBook²™ portable PC is the right choice for you, look at these guidelines before choosing your portable PC.

Processor

You'll need a 486DX2 processor at the very minimum. We strongly recommend a DX4. Spreadsheets, graphics and word processing all run better and faster with the DX4 processor. All Gateway 2000 portable PCs include a DX2 or DX4 processor.

Cache

Cache is great — that is when you can find it on a portable — because it gives you a superior performance. Our Liberty DX4-100 includes 256K L2 cache on an accelerated local bus yielding Pentium™-like performance. The ColorBook² includes 512K video cache for great video performance.

Hard Drive

Nothing less than a removable 340MB hard drive will do. In fact, you'll want the largest hard drive you can get. Microsoft® Windows,™ DOS® and standard software applications automatically consume around 140MB at the time of purchase. All Liberty and ColorBook² PCs include at least a 340MB removable hard drive. The Liberty DX4-100 Best Buy and ColorBook² DX4-100 Best Buy both include a 720MB removable hard drive.

RAM (Random Access Memory)

A bare *minimum* of 8MB RAM is best — 4MB wasn't enough last year. To run Windows (*and* Windows 95) you'll need 8MB. 8MB will also increase your battery life and improve system performance. All Liberty and ColorBook² systems come standard with 8MB RAM and are expandable to 20MB or 24MB RAM.

Screen

When you're talking portables, you want the biggest, clearest display possible without adding weight or hiking up the price.

A good way to judge screens is to divide the screen size of the portable by its weight. The higher the ratio the better. The Liberty has an incomparable screen size-to-weight ratio of 2.44. This 10.4-inch screen also gives you 23 percent more active viewing area than a 9.4-inch screen and 53 percent more than an 8.4-inch screen.

The Liberty's 10.4-inch and ColorBook²'s 10.3-inch screens give you the best value available in a color display. With vivid colors and bright, clear screens, you'll forget you're working on a portable PC.

Size and Weight

It's a portable PC — the smaller and the less it weighs, the better! The Liberty and ColorBook² emerge favorably in both areas.

Batteries

Look for between three and four hours of battery life depending on the processor and RAM. Batteries based on nickel metal-hydride (NiMH) or lithium ion will give you the best performance. The Liberty gives you up to four hours or more with power management. And it also allows for upgrading to a lithium ion battery.

Software

The better the included software applications, the more the value of your portable PC increases. Pre-installed on all Gateway portables is Microsoft Works for Windows 3.0 or MS Office Professional 4.3. The OAG® FlightDisk® and World Clock software is also included on all Gateway portables.

Keyboard & Pointing Device

You'll need a keyboard that's comfortable for you and that's also easy to use. The Liberty is equipped with a large palm rest, and flip-out feet so you can adjust the keyboard angle.

Pointing devices vary greatly. Again, find one that's easy for you to work with. Gateway's EZ Point™ integrated pointer is uniquely positioned to be comfortable and easily accessible.

Infrared Technology (IR)

Extras such as the Liberty's IR technology add even more value to your portable PC. With it you can take advantage of wireless file transfer — this means transferring files between the Liberty and your desktop (or between two Liberty PCs) without cables!

Service

You'll want to make sure you have the right support for your portable PC. When you buy from Gateway 2000, you have dedicated portables technical support for the life of your Gateway system. These technicians are trained to specifically handle all your portable questions and concerns. We also offer a special VIP warranty.

Now that you have all the facts, go ahead and shop around. Then call one of our friendly sales representatives about the very cool Liberty and ColorBook² portable PCs from Gateway 2000.

800-846-4769

COOL PORTABLES

Gateway 2000's portable PCs — the Liberty and ColorBook².

GATEWAY 2000® LIBERTY™

- 4.2 Lbs., 10" x 8" x 1.6"
- 10.4" DSTN Color Display
- 1MB Video RAM
- Choice of Desktop IR Receptor or External FloppyDrive
- Intel® 486 DX2 or DX4 Processor
- Instant On
- NiMH Battery & AC Pack
- 2 PCMCIA Type II Slots
- EZ Point™ Integrated Pointer
- Removable Hard Drive
- 78-Key Keyboard
- Parallel, Serial, VGA & PS/2® Ports
- Portable Specific Software
- MS-DOS® 6.22 & WFW 3.11
- Microsoft® Works for Windows™ 3.0 or MS Office Professional 4.3**

LIBERTY DX2-50

10.4" DSTN Color Display, 8MB RAM, 340MB HD, MS Works

$2749

LIBERTY DX4-100

10.4" DSTN Color Display, 8MB RAM, 540MB HD, 256K L2 Cache, MS Works

$3299

*LIBERTY DX4-100 Best Buy 48-Hour QuickShip**

10.4" DSTN Color Display, 24MB RAM, 720MB HD, 256K L2 Cache, TelePath™ 14.4 XJACK® Fax/Modem, Extra Battery, Leather Carrying Case, Desktop IR Receptor, External Floppy Drive, MS Office Professional 4.3**

$4499

COLORBOOK²™

- 5.7 Lbs., 11.65" x 8.5" x 1.77"
- 10.3" DSTN Color Display
- Intel 486 DX4 Processor
- 8MB RAM (expandable to 24MB)
- 1.5MB Video RAM (includes 512KB cache)
- Removable Hard Drive
- 3.5" Diskette Drive
- Integrated 16-Bit Sound and Speaker
- NiMH Battery & AC Pack
- EZ Point Integrated Pointer
- 2 PCMCIA Type II Slots
- 85-Key Keyboard
- Parallel, Serial, VGA & PS/2 Ports
- Padded Carrying Case
- MS-DOS 6.22 & WFW 3.11
- MS Works for Windows 3.0 or MS Office Professional 4.3**

COLORBOOK² DX4-100

8MB RAM, 340MB HD, MS Works 3.0

$2999

COLORBOOK² DX4-100 Deluxe

8MB RAM, 540MB HD, TelePath 14.4 Fax/Modem, Carrying Case, MS Office Professional 4.3**

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COLORBOOK² DX4-100 Best Buy

16MB RAM, 720MB HD, TelePath 14.4 Fax/Modem, Carrying Case. MS Office Professional 4.3**

$3999

Call for details on our portable PC options!

LIBERTY PROFESSIONAL PACK

MS Office Professional 4.3, PCMCIA TelePath XJACK 14.4 Fax/Modem, Extra NiMH Battery, Leather Carrying Case

$449

**48-Hour QuickShip program applies only to the Liberty DX4-100 Best Buy configuration. Your PC will be delivered within two business days from the time of order. No additions or deletions can be made to the configuration. Available for approved credit card orders only while quantities last. Domestic U.S. orders only. Call us for details about other QuickShip offers.*

***MS Office Professional 4.3 includes Word, Excel, PowerPoint® presentation graphics program, and Access® database.*

SERVICE AND WARRANTY

- Lifetime portable-specific toll-free service and support
- One-year limited parts warranty
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- Special VIP warranty. We'll ship a replacement to you within 24 hours during warranty. Only available at the time of purchase for an additional $100.

PAYMENT OPTIONS

- Gateway accepts most major credit cards and C.O.D. terms
- Net 30-day terms and leasing options available to qualified commercial customers
- You can also apply for the Gateway 2000 DuoLine™ MasterCard® card, issued by Dial National Bank, Des Moines, Iowa.

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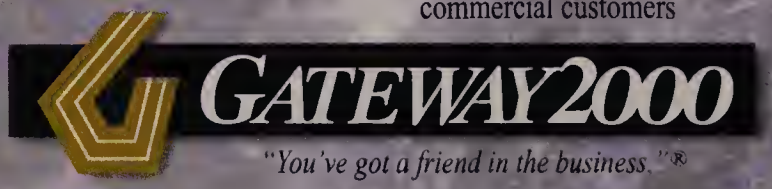

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Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

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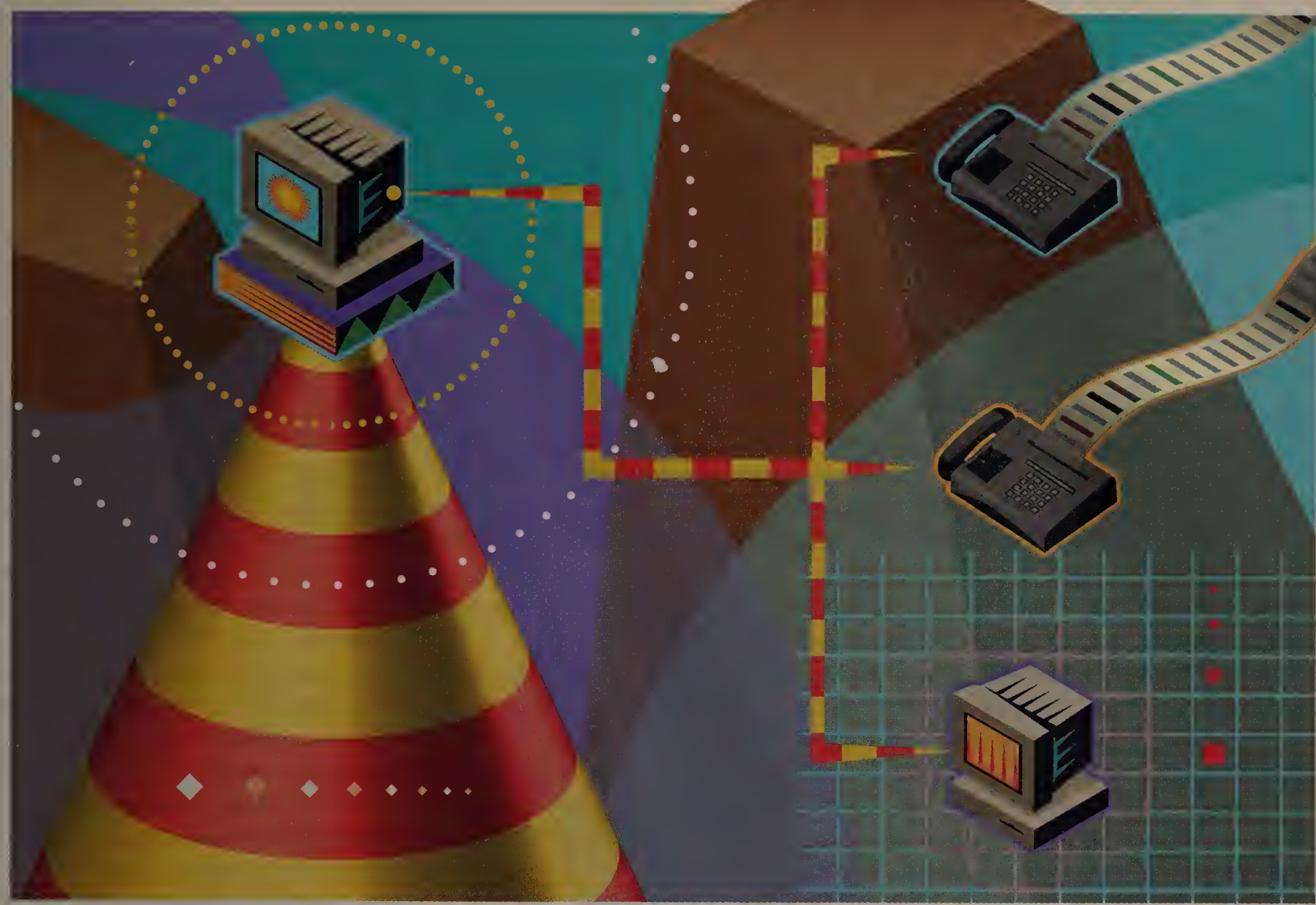


STEVEN LYONS

BY PETER SCISCO

BEST Fax-Communications Software

Fax and communications programs used to be like teenage siblings: They didn't like each other, hated to admit that they had the same parents, and were always fighting over the keys to the COM port. But as siblings mature, they eventually learn to get along.

Today you can buy combination fax and data communications packages, the best of which truly bring these tasks together. So what should you look for in a fax-comm package? Ease of use, mainly. Sending a message shouldn't require arcane codes.

Faxing from a Windows computer with any of these programs is pretty easy. Just select your fax-modem as your printer, print from any Windows application, then tell a dialog box where the fax should go. Or you can select a file to fax from within your fax program, although it may restrict you to a few file formats. Some programs allow you to send a file by dragging and dropping it from File Manager.

We rate six Windows programs that offer fax and communications in a single package.

Beyond basic fax operations like sending and receiving, the better fax programs provide annotation tools, auto-forwarding, cover page de-

sign tools, and optical character recognition (OCR) software that turns incoming faxes into editable text. A fax-back feature, which lets callers dial in to your computer to request faxed information, helps you distribute company literature. And the binary file transfer (BFT) standard allows you to send a file, whatever kind of file it is, that the recipient can edit without resorting to OCR.

On the data comm side, look for a program with out-of-the-box, fill-in-the-blank scripts for dialing in to the major online services and standard bulletin board systems (BBSs). It should have an E-mail manager that helps you read and write messages off line, keep a phone book, organize your mail, and attach binary files to your messages. Some can help you handle the Internet, too.

Once you've found good fax and comm modules, you'll want them to work together. They should have no problem sharing a COM port, and an integrated phone directory—while less common—is a nice plus.

Speaking of integration, simple fax-comm capabilities may soon be integrated right into your operating system. Windows 95 will have an integrated fax-comm program called Exchange, with a single phone book and a single inbox for incoming and outgoing faxes and E-mail messages. Exchange will lack a lot of features—it won't help you annotate or archive faxes, for instance—but if you want only basic fax and E-mail tools, you may get all you need in the next version of Windows.

Getting connected is what fax and comm programs are all about. And the two halves of PC communications are finally connecting.

Peter Scisco, a frequent PC World *contributor, writes, faxes, and sends E-mail from his home office in North Carolina.*

For more information about all products in this review, circle reader service no. 912.

Best Buys

Making PC communications easier means making it automatic. Depending on whether you're more comfortable sending faxes or E-mail, our two Best Buys give you the easiest and most complete way to put fax and data communications together as a single application.

For sheer breadth and depth in compiling, sending, receiving, and managing faxes, Delrina Communications Suite 2.1 is unmatched. By using a similar design in its online module, the suite trims learning time for novices. It also has a great tool for communicating on the Internet.

For seamless integration, Procomm Plus 2.0 for Windows is our hands-down favorite. Fax and data communications share everything, from the COM port to the dialing directory. The program makes it easy to send a document to anyone, anywhere—no matter how it has to travel.

01/Fax 3.0

PROS: Contact manager keeps tabs on communications

CONS: Poor interface and design, supports few file formats, DOS-only comm program

When a program's title sports any numeral besides a version number, you can bet it's some engineer's darling. The engineer who designed 01/Fax isn't much concerned with ease of use or aesthetics. For example, you don't print in this program, you "obtain a hard copy." Right. And I don't write magazine articles, I "generate narrative information."

Take the simple task of sending a fax: After you click the big Send File button, you must click the Phonebook button to open your directory, select the number, and click the Fax button to return to the Send Fax screen. If the fax number you select is a local one, you must click on the More Options button (are you following this?), then on the Dial Local Number option. I'd just as soon stand in line at a fax machine—at least I'd have somebody to talk to.

You can attach word processing files to a fax—if you use WordStar for DOS, WordStar for Windows, or WordPerfect for DOS, or convert your files first to ASCII text. And cover sheets? I've seen better ones at a mortuary. On the positive side, there's a nice integrated contact manager.

The program's comm module is nothing more than a bare-bones DOS program with no mouse support or E-mail management. The package's publisher has promised an integrated Windows communications module in version 3.1, which should be available by the time you read this.

Despite the low $99 price, we recommend that you don't answer the phone for this one. *01 Communique Laboratory, 800/668-2185, 905/795-0101 (fax).* **Reader service no. 762**

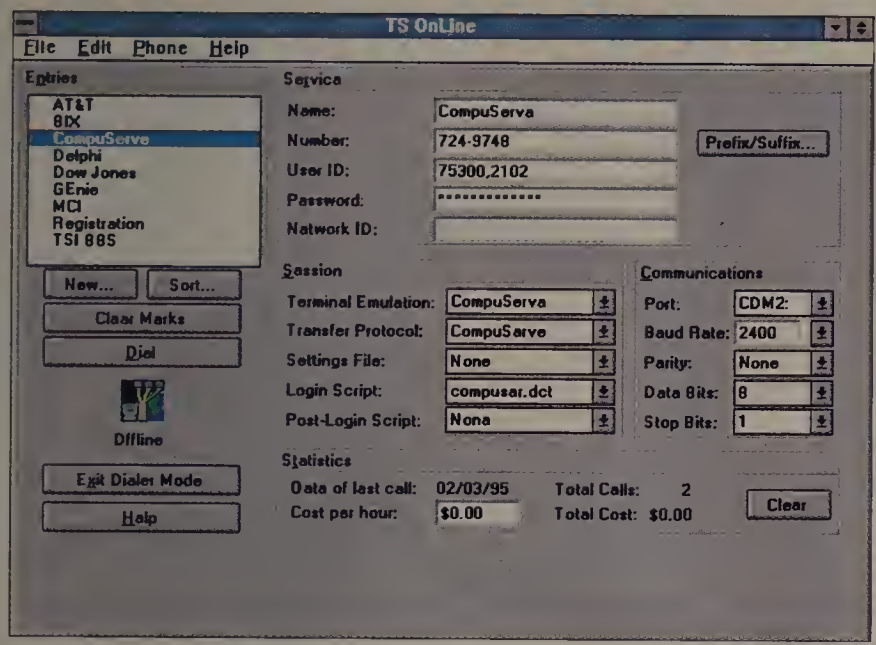
Bitware 3.2

PROS: Voice mail features, easy fax-on-demand service

CONS: Below-average management tools for E-mail and fax

If you have a modem that can handle voice, fax, and data, you're probably too busy to look at software. No problem—I found some for you. This $99 integrated message center juggles voice mail, fax, and data communications jobs with equal dispatch.

Bitware comes with advanced features that are remarkably easy to set up. For instance, in only four main steps you can have a fax-on-demand mailbox for retrieving faxes on the road or providing literature to interested clients. Also easy to use is Bitware's voice mail capability, which—with the right modem—lets small and home businesses achieve the same impersonal style as big companies, with assorted greetings, passwords, and instructions for using your Touch-Tone phone. The phone book integrates fax, data, and voice entries, so you can reach out and touch just about anybody.



THE SIMPLE DIALING DIRECTORY in Commworks' online module provides the basics, but only for a few services.

But plain old fax and comm jobs aren't nearly as graceful in Bitware. For instance, you can sort your sent and received faxes seven ways from Sunday, but you can't drop them into folders or archive them to save disk space. And the comm module won't lift a finger to manage E-mail or discussion groups.

This program is a good choice for users who need voice mail or fax-on-demand services. But if your requirements aren't that corporate, other programs provide better tools for managing your messages. *Cheyenne Communications, 800/243-9462, 516/484-3446 (fax).* **Reader service no. 763**

Commworks 1.0

PROS: Wide variety of connectivity tools, simple fax procedure

CONS: Lackluster quality in many tools, almost no integration

The only communications tool Commworks doesn't include is a pair of sneakers. But some of this suite's tools, including the fax and comm modules, are underpowered.

Commworks is fine for light fax use–it sports an uncluttered interface and even includes a few advanced features like scan and send, annotation, and archiving. But as soon as you demand more, you'll hit a wall. You can't, for instance, turn received faxes into text files. And although you can forward faxes, you can't set up a fax-back station. The archiving tools aren't as extensive as those found in Delrina's Communications Suite, but you can index faxes according to keywords for quick searching and retrieval.

The comm module is just a souped-up version of Windows Terminal, with modest improvements. You can automate log-ons easily with Commworks, but to automate what you do when you get there, be prepared to put in some time working on a script. Commworks' worst crime, however, is that its fax and comm modules can't share a common serial port; you must switch off the fax module before going online.

Commworks also comes with a remote control utility and the popular Laplink V file transfer program. Taken together, this collection is worthwhile for mobile workers, but it's not the tool of choice for heavy fax or comm chores. What's more, at $199.95 list, it's the most expensive program reviewed here. *Traveling Software, 800/343-8080, 206/487-1284 (fax).* **Reader service no. 764**

Delrina Communications Suite 2.1

PROS: Powerful fax tools, push-button data communications, Internet mail manager

CONS: Limited integration, steep learning curve for advanced features

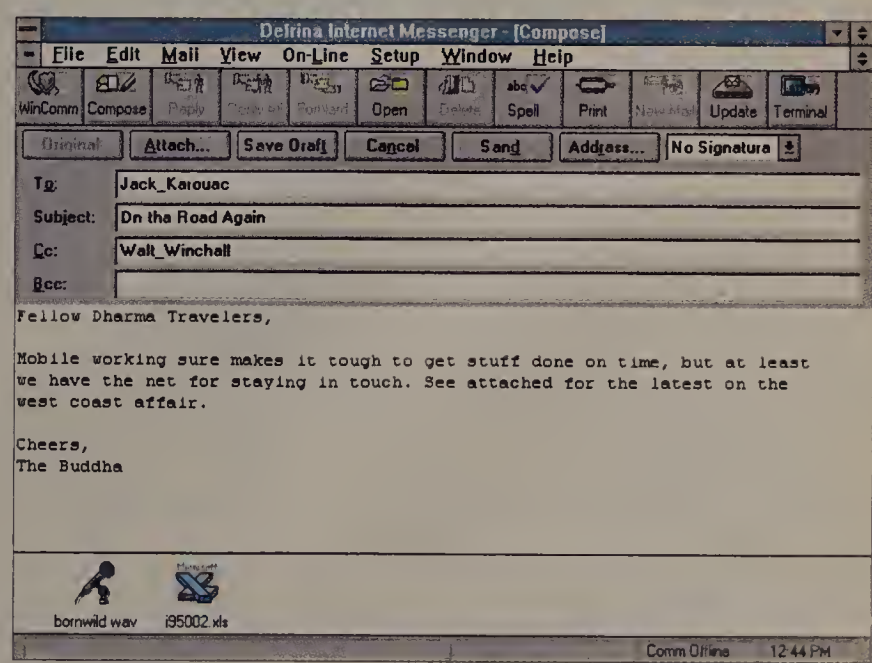
This formidable one-two punch combines the heavyweight champ of Windows fax software with a communications package that ranks in the quick-moving welterweight division.

WinFax Pro 4.0, the fax side of this $179 suite, was rated a Best Buy among fax programs (see "PC Faxing: Convenient but..." August 1994). Whether you need to link multiple documents from various sources to form a single transmission, or just send a quick fax with a professionally designed cover sheet, this program makes it easy—at least once you've learned how. In the ease-of-use department, WinFax is like a big word processor: You can pick up the simple jobs right away, but there's so much to learn—from cleaning faxes of stray marks to the countless ways to archive received faxes—that it can take weeks for everything to soak in.

The WinComm half of the suite isn't as spectacular, but the interface is similar enough to WinFax to make you feel comfortable. Both applications share a serial port (although not a phone book), so you don't have to turn off your fax software to go online.

WinComm comes with predesigned scripts for the major online services, making it easy to get started, as well as a wonderful Internet E-mail tool. But while WinFax Pro has everything you need for cataloging and organizing your faxes, WinComm Pro lacks similar tools for managing online sessions and E-mail.

The secret to this suite's power is WinFax Pro, which packs a powerful right hook. Integrated E-mail and fax phone books, along with tools for managing online sessions beyond Internet mail, would put the competition on the ropes. *Delrina, 800/268-6082, 408/363-2340 (fax).* **Reader service no. 765**



THE INTERNET MESSENGER TOOL in Delrina's Communications Suite makes it easy to stay in touch.

The new line of IBM PC Servers.

The difference between running a network and having a network run you.

300 320 500 720

Ask people who manage networks what they want in a PC server and everybody says the same thing: "Something to make life easier." So here they are—the new line of IBM PC Servers.

Along with the IBM PC Server 300 for small LANs and the 500 for enterprise networks, we introduce the IBM PC Server 320 with increased flexibility for expanding networks, and the 720, a superserver with highly advanced and easy-to-upgrade 1- to 6-way SMP.

So how do they make managing your network more manageable? First, with our new PC Server Start-Up support[1]—a part of HelpWare®—you can call us for free for the first 90 days and we'll handle any IBM and non-IBM installation or configuration problems. There's Server Guide, our CD-ROM software that streamlines setup and automatically fine-tunes for optimum performance. And finally, DMI-compliant NetFinity,™ our industry-leading software that manages both your PC server and PCs.[2]

That's making life easier. For complete details, call 1 800 IBM-4FAX (enter #8351777). Or visit your IBM Authorized Business Partner.

IBM PC Server 300:
Intel® 486DX2/66MHz processor or 60MHz Pentium™ processor, EISA/PCI, 8MB parity memory expandable to 128MB, 728MB hard drive, 8 open slots, 9 bays.

IBM PC Server 320:
Intel 90MHz Pentium processor, multiprocessor enabled, EISA/PCI, 16MB parity memory expandable to 256MB, ECC on SIMM optional, 256KB of L2 cache, SCSI-2 fast and wide, 6 open slots, 9 bays, standard CD-ROM.

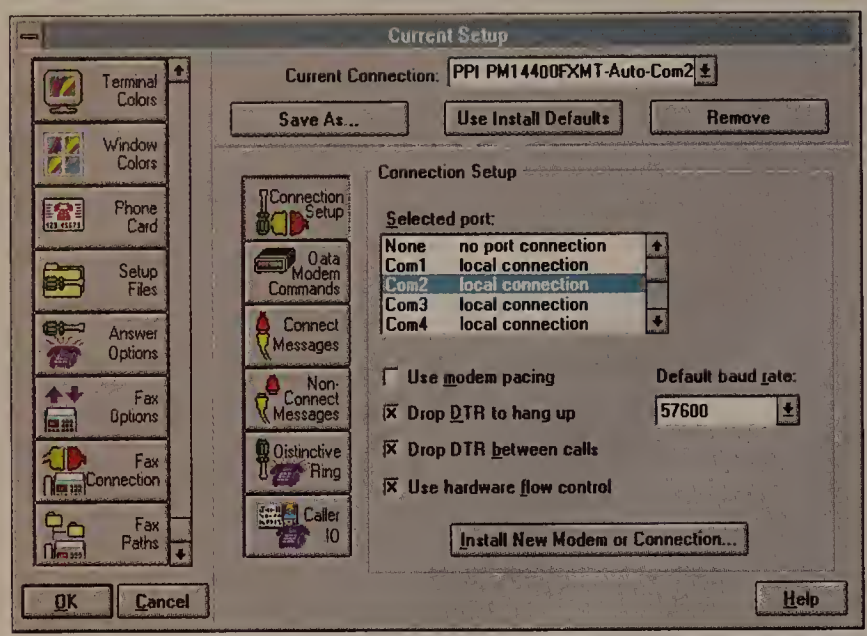
IBM PC Server 500:
Intel 90MHz Pentium processor, MCA, 32MB ECC memory expandable to 256MB, 256KB of L2 cache, SCSI-2 fast and wide, 6 open slots, 18 bays for hot-swappable drives, RAID-0, 1, 5 enabled, standard CD-ROM.

IBM PC Server 720:
Intel 100MHz Pentium processor, 1- to 6-way SMP, 64MB ECC memory expandable to 1GB, 512KB of L2 cache and 224B of L3 cache, SCSI-2 fast and wide, 7 MCA/PCI combination slots, 18 bays for hot-swappable drives, RAID-0, 1, 5 enabled, standard CD-ROM.

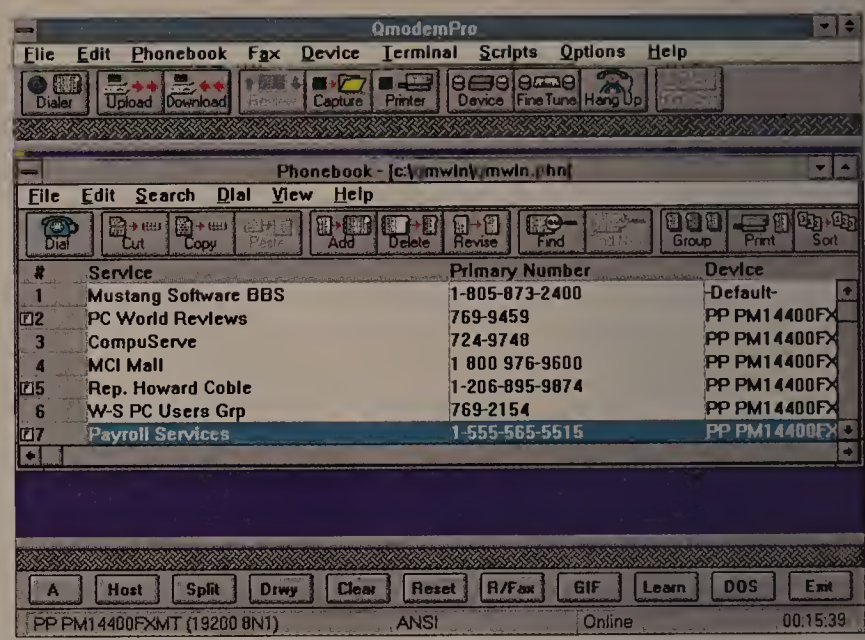
All Models:
30-day money-back guarantee, 3-year on-site warranty[1] (same-day service on 500 and 720, next-day on 300 and 320).

There is a difference™

[1]Copies of IBM's Statement of Limited Warranty, PC Server Start-Up support and 30-day money-back guarantee are available by calling 1 800 772-2227. [2]NetFinity is a member of the SystemView® family. Server Guide and NetFinity available as options on PC Server 300, standard on all others. MB=million bytes. IBM, HelpWare and SystemView are registered trademarks and NetFinity and There is a difference are trademarks of International Business Machines Corporation. Intel is a registered trademark and Pentium is a trademark of Intel Corp. © 1995 IBM Corporation.



TOTAL CONTROL over everything, from the sound of your phone to the color of your terminal windows, helps put Procomm Plus on top.



WHETHER YOU'RE SENDING FAXES OR DATA, you can easily spot the difference in Qmodem Pro's phone directory.

Procomm Plus 2.0 for Windows

PROS: Shared resources, integrated phone book, push-button data communications

CONS: Few fax management tools

This latest edition of a traditional favorite makes an easy-to-use graphical design even easier, integrating fax, data, and voice communications into one well-designed package.

Data comm has always been Procomm's strength, and this version blazes a path to the online world, with mail managers for CompuServe and MCI Mail. I've always said I'd give up my current MCI Mail front end when it was pried from my cold dead fingers, but this program is making me think twice.

For CompuServe, Procomm Plus's session manager includes control over forums as well as E-mail. Setting up the rules for each online session is straightforward, even for novices. Experienced infohounds will also reap immediate benefits with more-effective online voyages: If you need to automate your sessions beyond what the MCI Mail or CompuServe scripts allow, the program's excellent script recorder is almost as easy to use as a tape deck. And even beginning users should be able to automate their online connections with a minimum of bother.

The fax side of Procomm is no slouch either, though it lacks OCR support and WinFax Pro's sophisticated management capabilities. Beyond standard features such as fax scheduling and cover page design, Procomm enables you to forward faxes and set up a fax-back service. If you combine it with a modem that supports voice mail, the application can distinguish between fax, voice, and data calls.

Like Bitware, Procomm Plus for Windows completely integrates your fax and comm phone books. Within the program's unified dialing directory, you can store data, fax, and voice numbers individually and in groups. Dialing any number is as easy as pressing a button, without having to worry about where the message is going or how it will get there.

Whether you're an old hand at online communications or getting flamed for the first time, you'll be

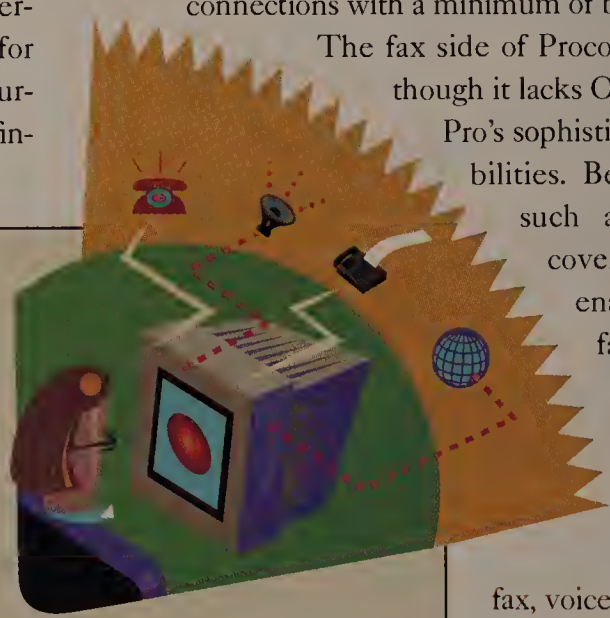
On The Horizon

Magazine writers have deadlines, but the world of fax-comm software keeps spinning. Here are four new programs or upgrades that weren't ready for this article:

01/FAX 3.1: The folks at 01 Communique are integrating a Windows-based data communications module with the program's contact manager, whether we like it or not. A separate program, 01/VoiceFax, will provide fax-on-demand and voice mail services. List price: $99. *01 Communique Laboratory, 800/668-2185, 905/795-0101 (fax).* Reader service no. 768

BITWARE 4.0: The vendor promises to strengthen the product's fax capabilities with annotation tools, direct paging through SkyTel, and multilingual OCR support. The voice component will include voice broadcasting and voice-on-demand. List price $199. *Cheyenne Communications, 800/ 243-9462, 516/484-3446 (fax).* Reader service no. 769

HOTFAX: This new program will offer fax broadcasting, OCR, and sophisticated archiving, plus telephony features such as caller ID. List price: $129.95. *Smith Micro Software, 714/ 362-5800, 714/362-2300* (fax). Reader service no. 770



ONLINE DISCOVERY: The makers of FaxWorks Pro will integrate America Online, Prodigy, GEnie, CompuServe, and Internet support into the company's already-powerful fax program (a *PC World* Best Buy). According to SofNet, the product will be geared toward first-time comm users. List price: $49.95. *SofNet, 800/329-9675, 404/457-9500* (fax). Reader service no. 771

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Circle 169 on reader service card

hard-pressed to find an easier way to mix in a little fax with your comm. Procomm Plus for Windows lists for $179. *Datastorm Technologies, 314/443-3282, 314/875-0595 (fax).* **Reader service no. 766**

Qmodem Pro 1.1 for Windows

PROS: Excellent integration, shared resources

CONS: Sparse fax management capabilities

Integration is key to this $99 blend of basic fax and comm tools. But in Qmodem's admirable attempt to balance both sides of the scale, the weight shifts to the online comm features.

Qmodem Pro integrates your fax and E-mail contacts into a single phone book, but it doesn't handle voice numbers. Fax numbers are identified by a small icon, color-coded to tell you whether an outgoing fax to that number is pending. To send a quick fax to anyone in the directory, you just double-click the recipient's name and fill in complete information in the resulting dialog box. And when you fax from your word processor or other Windows application, Qmodem is smart enough to filter out your phone book's data comm addresses and display only the fax numbers.

But Qmodem's fax tools are sparse. The only file formats it supports for attachments are ASCII text and PCX and BMP graphics. There's little it can do to index your faxes, and you can forget about marking a fax with your comments. Also, creating or modifying a cover page requires changing a script. If you think of script writing as a glamorous activity, you're in for a rude surprise.

The comm side of the package is more fully developed, owing no doubt to the company's products for BBS operators. Although Qmodem comes with only one fully defined script (for the company's support BBS), there's a generic script you can alter to automate connections to CompuServe, MCI Mail, and GEnie. For other connections, users can record their keystrokes, which the program then compiles. A toolbar offers push-button navigation through online sessions.

By adding only basic fax capabilities to its high-powered communications tools, Qmodem opens the door just part of the way to fax users. Its emphasis on data communications will keep it a favorite only among accomplished online travelers. *Mustang Software, 805/873-2500, 805/873-2599 (fax).* **Reader service no. 767**

Features Comparison

DELRINA, PROCOMM LEAD THE PACK

● = Yes ○ = No

	01/Fax 3.0	Bitware 3.2	Commworks 1.0	Delrina Communications Suite 2.1	Procomm Plus 2.0 for Windows	Qmodem Pro 1.1 for Windows
Standard features						
List price	$99	$99	$199.95	$179	$179	$99
Disk space required (MB)	4	5	6.5	18.5	9.5	5
Memory required (MB)	4	4	2	8	4	4
Fax and communications share COM port	○	●	○	●	●	●
Fax and communications share phone book	○	●	○	○	●	●
Fax						
Binary file transfer	○	○	○	●	●	○
Microsoft at Work support	○	○	○	●	○	○
Drag and drop from File Manager	○	●	○	●	●	●
Predefined send macros	2	2	2	5	○	○
Autodelete after send	●	●	○	●	●	○
Preview/schedule send/resubmit	●	●	●	●	●	○
Fax support	○	●	○	○	●	○
OCR	●	○	○	●	○	○
Cover page designs included	15	1	6	105	18	1
Search tools	●	●	●	●	○	○
Create folders to store faxes	●	○	○	●	○	○
Thumbnail view of faxes	●	●	●	●	○	●
Archiving	●	○	●	●	○	○
Data communications						
Protocols supported	7	5	5	9	11	10
Terminal emulations	3	10	6	16	34	35
Scripts included	1	20	22	17	11	4
E-mail manager	○	○	○	●	●	○

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  VocalTech's Internet Phone
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BEST

BY PATRICK MARSHALL

AND BRYAN HASTINGS

Fax-Modems

Our Choice for superfast V.34 fax-modems—possibly the last ones you'll ever buy.

Anyone who has ever tried to preview an image file on CompuServe must feel a bit like a prospector on a slow boat to the Yukon. Even at 14.4 kilobits per second, some of the things you really want to get at, such as graphics, multimedia, and complex program files, can take forever to pull down from an online service or BBS. The seven modems reviewed here, which can exchange files at a blazing 28.8 kbps, promise to ease your passage to the exciting, potentially profitable online frontier. If you do a lot of downloading, in only a couple of months you could save enough in telephone bills to pay for the modem.

For over a year, 28.8-kbps modems based on a protocol called "V.fast class" (V.fc) have been available. However, these modems only rarely achieve their maximum speeds. V.fc is not an official modem standard, and it's very finicky. It demands ideal and stable line conditions for top-speed connections. Even then, top speed may not be possible between certain pairs of V.fc modems. Since V.fc is not an official standard, there are fewer controls on the way modem makers build it into their products, so implementations vary. The upshot is that your connections with these modems will likely peak out at 21.6 or even 19.2 kbps. While this represents a marked improvement over the ubiquitous 14.4-kbps modems, it's still a far cry from true top speed. So when you're shopping for a top-speed modem and you see one that's particularly inexpensive, check the label carefully—it might be V.fc.

What you want is a 28.8-kbps modem that conforms to the new industry standard called V.34; all the modems reviewed here do. V.34 was designed to allow modems to establish consistent, reliable connections at 28.8 kbps. Its strength is its ability to grapple with the wide quality variance of the typical phone connection, something that's imperceptible to the ear but can play havoc with high-speed data. When two modems connect at 28.8 kbps using V.34, they can monitor the phone line together and dynamically adjust for variations in order to hang onto the 28.8 connection. By comparison, V.32bis and slower modems establish a link based only on the line conditions at the time the connection is initiated. If the quality of the connection changes, these modems may drop the link.

V.34 modems based on the Rockwell chip set—such as the Hayes, Practical Peripherals, Supra, and Zoom units we review here—as well as some U.S. Robotics V.34 modems (including the Sportster 28.8), also come with V.fc, so they will be able to talk to the significant installed base of V.fc-only modems at speeds higher than 14.4 kbps.

The modems in this roundup also feature solid error control and data compression abilities. All the modems support V.42 error control and V.42bis data compression (the latter protocol can compress your data on the fly up to a quarter of its original size, allowing for peak data transfer rates beyond 115 kilo-

TX RX OH AA EC
MR TR RS CS CD
MODE
PC288LCD
V.34
OPTIMA
288
Hayes
MOTOROLA
V.34R
TALK / DATA
TALK
105 106 108 104 103 109
RS CS TR RD TD CD
U.S.Robotics
Sportster
28,800 FAX MODEM

bits per second). Error control ensures the integrity of your data so no mistakes get through during transmission. All fax-modems in this group also support 14.4-kbps fax transmissions.

Judging Modems

In this roundup of V.34 modems, prices range from a low of $265 (street price) for the Supra FaxModem 288 to $799 (list) for the Multi-Tech unit. But we did more than just look at straight price/performance ratios. We put the seven V.34 modems through a rigorous set of tests. For each model, we connected a pair of modems through a telephone network simulator, establishing more than 200 connections per pair over several dozen line conditions that together represent the vast majority of line conditions your modems will encounter. (See the methodology in the Test Report.) In our tests we looked at two main performance aspects: How reliably does the modem establish connections, and how fast does it send files using compression? Despite the similarity of hardware and the fact that all the modems support the same set of protocols, we found significant differences in performance, with the Hayes, Motorola, and Practical Peripherals products coming out on top.

The modem's V.34 chip set isn't the only factor that determines its speed. As evidence, the second-best performer (the Practical Peripherals PC288LCD V.34) and the worst performer (the Supra FaxModem 288) are both based on the Rockwell chip set. More significant is a modem's firmware. Also a factor is the size of its data dictionary. If you're transferring uncompressed files, a large dictionary—which substitutes symbols for recurring patterns of data—can improve transfer speeds significantly. On the other hand, if the files are already compressed or are not very compressible (such as program files), a large data dictionary can actually slow you down. The Hayes and the Practical Peripherals modems have the largest dictionaries. For the fax tests, our methodology was considerably simpler—could the modem send and receive a fax? All the modems passed this test.

Ease of Use

There are factors other than performance you'll want to consider when selecting your modem. Does the modem offer digital readouts of its status or hard-to-decipher LED indicators? Does the unit have an external control for adjusting the speaker volume? Is there a power switch on the front or do you have to reach around back to reset the modem? Only the Practical Peripherals and Supra modems offer digital readouts, and only the Multi-Tech, Practical Peripherals, and U.S. Robotics units have a manual volume control.

Security features are another consideration, particularly for workgroups. The Motorola, Multi-Tech, and Supra models offer password protection and callback capabilities. If you use password protection, those who call in to your modem will have to know your password to establish a connection. If you set the modem for callback, it will return any incoming calls, a feature used by companies to centralize phone charges as well as for security. A few of the modems also offer Caller ID detection, which allows software on your end to display the caller's number.

You'll also want to note the type of fax support the modem offers. All the modems except the Multi-Tech support the original Class 1 standard, and more than half also support Class 2.0, which allows the modem to take over more communications chores from the computer. If you often change the configuration of the modem—enabling or disabling protocols, setting callbacks, and changing initializing parameters—then check whether the modem allows you to store multiple configurations. The Motorola and Multi-Tech units even let you change the modem configuration remotely.

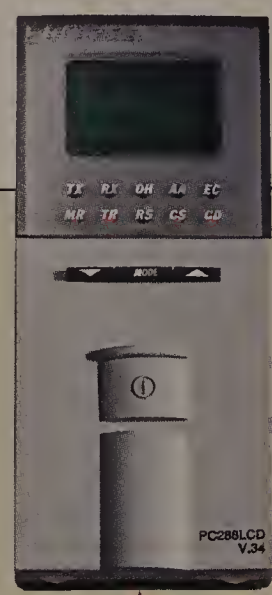
Finally, look at the support policies. Motorola's two-year warranty period is the shortest, while the Practical Peripherals PC288LCD has a lifetime warranty plus the longest support hours. The Motorola's high price includes toll-free support, which the Multi-Tech offers as well. All the vendors say they will cross-ship replacement modems on a case-by-case basis, which means if your modem fails while under warranty, you can get a replacement modem without waiting for the company to receive your defective unit.

The best value in the pack is Practical Peripherals' PC288LCD V.34: It rates near the top in performance, it was the friendliest modem to set up and use, and it's backed by excellent support.

Is this the right time for you to buy? The more data you send on a daily basis, the more you should consider the step up to V.34. If all you're waiting for is a still-faster modem to hit the market, don't hesitate—V.34 is probably the last analog modem standard before even faster digital ISDN becomes more common. However, if you spend most of your time bopping around online services, you may want to wait a bit. Most of the major services, including CompuServe, have only recently moved up to 14.4 kbps. But even the online world is beginning to support V.34. America Online is providing trial 28.8-kbps service in over a dozen cities, and direct 28.8-kbps access to the Internet is growing. In short, many people will find upgrading immediately to V.34 worthwhile.

Best Buy

When it comes to the best combination of price, performance, features, and support, Practical Peripherals' PC288LCD V.34 is way ahead of the pack. For $459, you get the next-best performer of this group, niceties such as an English-language status panel and a manual volume control, as well as a lifetime warranty and generous tech support hours.



Patrick Marshall is a contributing editor for InfoWorld *magazine, and Bryan Hastings is an associate editor for* PC World. *Research and testing was conducted by Susan Silvins in the PC World Test Center.*

For more information about all products in this article, circle reader service no. 901.

Hayes Optima 288 V.34/V.FC + Fax

PROS: Good performer
CONS: No support for Class 2.0 fax

Hayes delivers a solid, if not flashy, performer in its Optima 288 V.34/V.FC + Fax. The Optima offers above-average performance and comes with a good set of programs. While the Optima loses a few points for not supplying any DOS software, the included Windows data comm and fax programs—Smartcom LE and Smartcom Fax—are well designed and easy to use.

Otherwise, the Optima doesn't stand out. You don't get any extras such as password protection or callback, and the modem supports only the original Class 1 fax standard. Also, status is indicated only by LEDs, and there is no manual volume control. The user's manual is well written and includes a helpful troubleshooting section, but it lacks an index, and there is no beginner's section. If you opt for the Optima, you get a fast, reliable unit—but it's no steal at $579. *Hayes Microcomputer Products, 404/441-1617.* **Reader service no. 601**

Motorola V.34R

PROS: Top performer, security features, toll-free support
CONS: Pricey, no Class 2.0 fax support, could use better documentation

No modem we tested could match the performance of the Motorola V.34R. This speedster ripped through our performance tests and had higher successful connection rates than the rest of the pack. And the V.34R comes with special features such as password protection and callback capabilities. Motorola has also bundled relatively strong data and fax communications packages: ComIT, WinCom Lite, FaxTalk and FaxTalk Plus.

However, the V.34R gets no special points for ease of use. For one, its documentation is densely written. Also, while the unit has a handy voice/data switch, it's not well labeled, the modem lacks an external volume control, and the reset switch is inconveniently located on the back panel. This modem also has limited support from communications programs. While we were able to get the V.34R to work with at least basic functionality using configuration files for other Motorola models, we couldn't find any programs that directly support it. So if you're considering this modem, you may want to check to make sure your software is optimized for use with it.

These factors, and the V.34R's relatively high $595 price, kept the unit from getting a Best Buy. But if performance is key, this is your modem. *Motorola ISG, 800/487-1456.* **Reader service no. 602**

Multi-Tech MT2834BA-ISI

PROS: Rugged case, built-in passwords and callback feature, toll-free tech support
CONS: Very steep price, lacks most ease-of-use features, subpar documentation

The MT2834BA-ISI offers features many corporate users want, such as password protection, callback capabilities, and a bank of dip switches to let you manually set the modem's configuration. There's a switch on the front for toggling between voice and data modes and, in the rear, a power switch and a volume control.

Can Your PC Keep Up?

Just because you have a fast V.34 fax-modem doesn't mean you automatically enjoy these faster speeds. The first common bottleneck is your computer's serial port. Your modem attaches to the PC through this port, and its circuitry processes the incoming modem data into a form your computer can use. The key player in your serial port is a microchip called the Universal Asynchronous Receiver/Transmitter (UART). The problem is, despite ever faster processors, system buses, and hard drives, most computers today are still sold with serial ports that contain outmoded 8250 or 16450 UART chips that can't reliably juggle incoming data faster than 9600 bps.

The solution is to buy an I/O board with a serial port supported by a 16550 UART chip. At only about $40, such a board gives an inexpensive boost to your reliable data transmission speeds. If the 8250 or 16450 UART on your existing serial port is socketed instead of soldered to the board, and you're not afraid to delve under the PC's hood, the upgrade may be even cheaper. In many cases, you can buy a 16550 chip for about $15 and pop it into the socket where the 8250 or 16450 currently resides. If you buy an internal modem, you can probably ignore this thorny issue—there's usually a 16550 UART right on the modem board.

If your budget is flexible and you need to wring every last bit of speed out of your system, consider Hayes's ESP-2 Communications Accelerator ($99). This 16550-UART–compatible card allows your PC to communicate with the appropriate modem at up to 230 kbps. This is important because when files using maximum data compression come through your 28.8-kbps modem, they can travel between your modem and your PC faster than 115 kbps, the limit imposed by most serial ports.

Once you get the serial port issue squared away, there's a common software limitation to wrestle with. Windows' own communications driver can get tripped up handling fast data. The version of this driver (comm.drv) found in Windows 3.1 and Windows for Workgroups 3.11 can't take full advantage of the capabilities of the latest serial ports. In fact, it can't reliably handle data faster than 9600 bits per second. The remedy is to replace this anemic piece of software with something more robust. A popular substitute is TurboCom/2, the communications driver supplied in the TurboCommander package from Pacific CommWare. Things should get easier with Windows 95—that system's comm driver will easily juggle data at 28.8 kbps.

Hayes Microcomputer Products; 800/964-2923 **Reader service no. 608**
TurboCommander $50; Pacific CommWare; 800/856-3818 **Reader service no. 609**

This capable performer comes with the company's own easy-to-use MultiExpress fax/data software, and the TalkShow package, which converts the PC into an electronic "whiteboard."

The drawbacks? The Multi-Tech's documentation is a tough read; but even more important is the fact that this corporate modem comes with a steep corporate price of $799. *Multi-Tech Systems, 800/328-9717, 612/785-3500.* **Reader service no. 603**

Practical Peripherals PC288LCD V.34

PROS: Excellent performance, easy-to-read digital status display, handy controls, great support

CONS: No telephone switch-off during data transfer

If you're looking for the best overall value in a V.34 modem, look no further. No product in this current crop offers a stronger combination of performance and ease of use than Practical Peripherals' $459 PC288LCD, which earns it this review's sole Best Buy.

For starters, the PC288LCD V.34 turned in a performance second only to that of Motorola. The PC288LCD showed an ability to achieve connections successfully on almost every try. And while this modem's case is decidedly high-tech, with its vertical form resembling the monolith in the film *2001: A Space Odyssey*, it's a very friendly little unit. In addition to the usual LEDs that display modem status, the PC288LCD V.34 has a nifty LCD readout display that tells you just what's going on as the unit negotiates with the other modem, then provides updated reports on connect speed, line quality, type of error control used, and even the time. You can move through menus in the display to edit a configuration profile, adjust the volume, and perform other chores.

We have only two gripes. For one, connecting and disconnecting the modem's cables is a bit cumbersome. Second, if you're using the modem and you pick up a telephone that's hooked up to it, you risk dropping the modem connection. Even so, the PC288LCD's high performance and its ease of use—which is also enhanced by strong documentation, a lifetime warranty, and extended support hours—make this unit the clear Best Buy in this roundup. *Practical Peripherals, 805/497-4774.* **Reader service no. 604**

Supra FaxModem 288

PROS: Great price, lots of security features, cellular data support

CONS: Very poor performance, no telephone switch-off during data transfer

With a $265 street price, the Supra FaxModem 288 is the least-expensive entry in this roundup, and it has some great features. It offers an informative readout panel, it's strong on security features, and it supports cellular data (MNP-10). Finally, its documentation is decent, with quick-start and troubleshooting guides.

Alas, the modem came in dead last in all our benchmarks, sending data at only about half the rate of the faster modems, and making connections in less than a quarter of **continued on page 173**

The Marriage of Voice and Data

How would you like to be able to talk on the phone while sending a file over the same line? Or play a game via modem while talking to your opponent, again over the same line?

While the fax-modems we reviewed won't perform such tricks, V.34 units may be able to by the time you read this. The simplest technology, known as VoiceView, should soon appear on many modems. Developed by Radish Communications Systems, VoiceView will let you quickly alternate between talking on the phone and sending a file, without having to hang up the phone and redial.

Even more exciting are the line-sharing methods that will let you speak and send files at the same time. One of them already on the scene is AT&T Paradyne's VoiceSpan technology, found in the company's DataPort 2001 14.4-kbps modem. VoiceSpan works by splitting a phone line into two fixed channels: one for data communications and the other for analog voice communications. The advantage to using this method is that you'll always hear high-quality speech. On the other hand, uncompressed data speeds on this modem and other 14.4-kbps modems using VoiceSpan won't exceed 4800 bps. (The voice channel gobbles up the equivalent of nearly 10 kbps of bandwidth.) Those 28.8-kbps modems using VoiceSpan won't pass uncompressed data faster than about 18 kbps.

Various simultaneous voice/data line-sharing technologies make more efficient use of the phone line than VoiceSpan by digitizing both voice and data. Such techniques allow for on-the-fly adjustment of the line depending on conditions at the moment. For example, a file transfer will automatically speed up during pauses in your phone conversation. Examples of all-digital line-sharing methods are Multi-Tech's Multi-Tech Supervisory Protocol (MSP), to appear exclusively in Multi-Tech modems; and digital simultaneous voice/data (DSVD), a future protocol being developed by a group of major modem vendors including Hayes and U.S. Robotics. As with VoiceView, DSVD should be seen in modems by the middle of the year. The drawback to all-digital line-sharing technologies? Voices can sometimes sound distorted, and there can be noticeable delays between parties on the phone line, which can make conversation a little awkward.

Unfortunately, none of the modems we examined in this roundup let the modem and host PC serve as a telephone/fax/data messaging center. Many slower modems already have voice-mail support, however, and you can expect to see it on V.34 models later this year.

All Eyes Are On Quantex!

It's no wonder. After all, Quantex offers such terrific systems, incredible features and great prices folks just can't wait to see what we come up with next. We're always on the leading edge of technology for both performance and speed. And when you add in the kind of CD bundles we include, it's just bound to catch your eye and your imagination.

Just don't blink...you might miss something.

intel inside

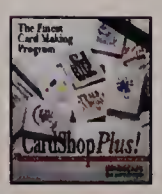
Take a Good Look at All We Have to Offer!

You won't believe your eyes.

When it comes to pure power, seeing is believing. Pentium™ Processors blazing at **75MHz** through **120MHz** now benefit from third generation PCI technology! The new **Triton PCI Chip Set**[1] provides performance advancements of up to 30% over its predecessor in Windows application benchmarks!

And for peak video performance, we add the award-winning **ATI MACH 64** PCI Graphics Accelerator[2], the top choice for razor-sharp images, photographic image quality in up to 16.7 million colors, plus scorching speed! With performance that'll make you sit up and take notice, Quantex is an industry visionary.

System Picture with Tower Case and 17" MAG Monitor.



Bundle MS-Comptons Interactive Encyclopedia, Dragon Lore, CardShop Plus Deluxe, Mayo Clinic Family Health Book, Quicken SE and Main Street select.

Bundle PO-The Complete Reference Library, Dragon Lore, EveryWhere USA Travel Guide, Quicken SE, and PerfectOffice standard.

(Main Street select includes Works, Infocentral, Grammatik, Webster's Dictionary, Clip Art for the home, Wallobee Jack "The Lost Lionardo" and Paper Planes)

(PerfectOffice standard includes WordPerfect 6.1, Quattro Pro 6.0, Infocentral, Presentations, Envoy and GroupWise)

Catch a Glimpse of the Future.

Quantex invites you to take a peek "under the hood" -- you'll find these systems packed with the market's hottest new technology. Like **Quad Speed CD-ROM** drives with 190ms Random Access time and a 256KB data buffer capacity -- that means smoother video display with no delays! We also provide your "on-ramp" onto the Information Superhighway with our speedy **14,400 and 28,800 baud** FAX/modems, plus one month's free access to **America On-Line®**, **CompuServe®**, and **Prodigy®** on-line services. Don't worry, your eyes are not deceiving you. Quantex's performance hardware gives you the ability to envision tomorrow's technology today.

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We look after your system long after your purchase. Check out our 30-day Money Back Guarantee, One Year Free On-Site Service, and One Year Free Parts & Labor Warranty along with a lifetime of toll-free phone support. Plus, we even offer the **GE Service Protection Plus Plan** option, which keeps your Quantex system covered for three additional years. The more you read, the better we look!

PC WORLD BEST BUY

DEC. 94 JAN. 95
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PC WORLD

"The Quantex QP5/90 is a classic Power Desktops Top 20 System...you get an incredible amount of machine for the money." (3/95)

COMPUTER SHOPPER

The Quantex QP5/90 is as close to a turnkey multi-media PC as any machine we've seen." (11/94)

QUANTEX Microsystems, Inc.

Q486DX2/66 XM $1649

- Intel DX2™66 Processor
- 8MB RAM, 128KB Fast Cache*
- 540MB 11ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- 64-Bit PCI Bus Graphics w/ 1MB
- 15" Digital .28mm Color Monitor
- 11-Bay Mid-Tower Case
- 101-Key keyboard & Mouse
- 14,400 Baud Fax/Modem
- Toshiba 4X CD-ROM Drive (190ms)
- 16-Bit Sound Card & Speakers
- MS-DOS & Windows for Workgroups 3.11
- Quicken® Financial Manager-SE
- Bundle MS: Compton's Interactive Encyclopedia 95, Dragon Lore, Mayo Clinic Family Health Book, CardShop Plus Deluxe,and WordPerfect Main Street select.

Q486DX4/100 XM.....$1749
QP5/75 XM.....$1869

QP5/75 XM-1 $1949

- Intel 75MHz Pentium™Processor
- 8MB RAM, 256KB Fast Cache
- 850MB 10ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- 64-Bit PCI Bus Graphics w/ 1MB
- Award-Winning 15" MAG Monitor
- 11-Bay Mid-Tower Case
- 101-Key keyboard & Mouse
- 14,400 Baud Fax/Modem
- Toshiba 4X CD-ROM Drive (190ms)
- 16-Bit Sound Card &Speakers
- MS-DOS & Windows for Workgroups 3.11
- Quicken®Financial Manager-SE
- Bundle MS: Compton's Interactive Encyclopedia 95, Dragon Lore, Mayo Clinic Family Health Book, CardShop Plus Deluxe,and WordPerfect Main Street select.

QP5/90 XM-1.....$2069
QP5/100 XM-1.....$2199

QP5/90 XM-2 $2099

- Intel 90MHz Pentium™Processor
- 8MB RAM, 256KB Fast Cache
- 850MB 10ms IDE Hard Drive
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- 11-Bay Mid-Tower Case
- 101-Key keyboard & Mouse
- 14,400 Baud Fax/Modem
- Toshiba 4X CD-ROM Drive (190ms)
- 16-Bit Sound Card &Speakers
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Q486DX2/66 XM-2*.....$1749
Q486DX4/100 XM-2*.....$1849
QP5/75 XM-2.....$1979
QP5/100 XM-2.....$2229

QP5/90 XM-3 $2389

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- 850MB 10ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- 64-Bit PCI Bus Graphics w/ 2MB
- 15" Digital .28mm Color Monitor
- 11-Bay Mid-Tower Case
- 101-Key keyboard & Mouse
- 14,400 Baud Fax/Modem
- Toshiba 4X CD-ROM Drive (190ms)
- 16-Bit Sound Card &Speakers
- MS-DOS & Windows for Workgroups 3.11
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- Bundle PO: The Complete Reference Library, Dragon Lore, EveryWhere USA Travel Guide, and **WordPerfect PerfectOffice Standard**.

Q486DX4/100 XM-3*.....$1999
QP5/75 XM-3.....$2269
QP5/100 XM-3.....$2499
QP5/120 XM-3.....$2749

QP5/100 SM $2599

- Intel 100MHz Pentium™ Processor
- **Intel Triton PCI Chip Set Architecture**
- 16MB RAM, 256KB Fast Cache
- 850MB 10ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- **ATI MACH 64 PCI Accelerator w/ 2MB DRAM**
- 15"Digital .28mm Color Monitor
- 11-Bay Mid-Tower Case
- 101-Key keyboard & Mouse
- **28,800 Baud V.34 Fax/Modem**
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- 16-Bit Sound Card w/Speakers
- MS-DOS & Windows for Workgroups 3.11
- Quicken® Financial Manager-SE
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Q486DX4/100 SM*.....$2099
QP5/75 SM.....$2369
QP5/90 SM.....$2489
QP5/120 SM.....$2849

QP5/100 SM-1 $2999

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- Quicken® Financial Manager-SE
- Bundle PO: The Complete Reference Library, Dragon Lore, EveryWhere USA Travel Guide, and **WordPerfect PerfectOffice Standard**.

QP5/75 SM-1.....$2749
QP5/90 SM-1.....$2869
QP5/120 SM-1.....$3249

QP5/120 WS-1 $3199

- Intel 120MHz Pentium™ Processor
- **Intel Triton PCI Chip Set Architecture**
- 16MB RAM, 256KB Fast Cache
- 1280MB 10ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- **ATI MACH 64 PCI Accelerator w/ 2MB VRAM**
- **Award-Winning 17" MAG Monitor**
- 11-Bay Mid-Tower Case
- 101-Key keyboard & Mouse
- **28,800 Baud V.34 Fax/Modem**
- Toshiba 4X CD-ROM Drive (190ms)
- MS-DOS & Windows for Workgroups 3.11

QP5/90 WS-1.....$2799
QP5/100 WS-1.....$2899

Upgrade Specials

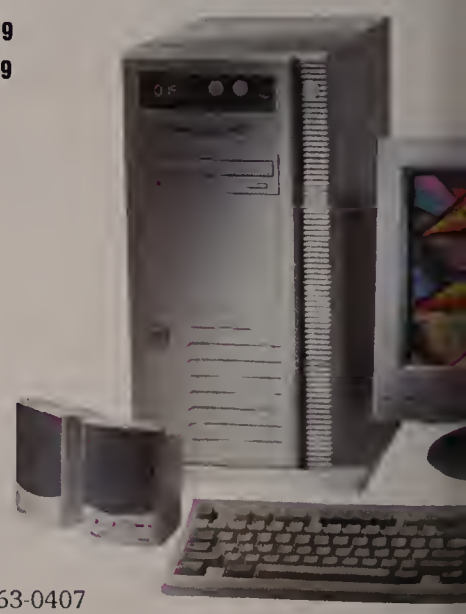
"Options Available with System Purchase"

- **Add a Conner 420MB tape backup unit for $149 more.**
- **Add a Panasonic KX-6100 Laser Printer for $399 more.(6 ppm, 600 dpi class print quality, Windows'95 compatible)**

Caviar — Western Digital

ATI — Perfecting the PC

intel inside



QUANTEX Microsystems, Inc.

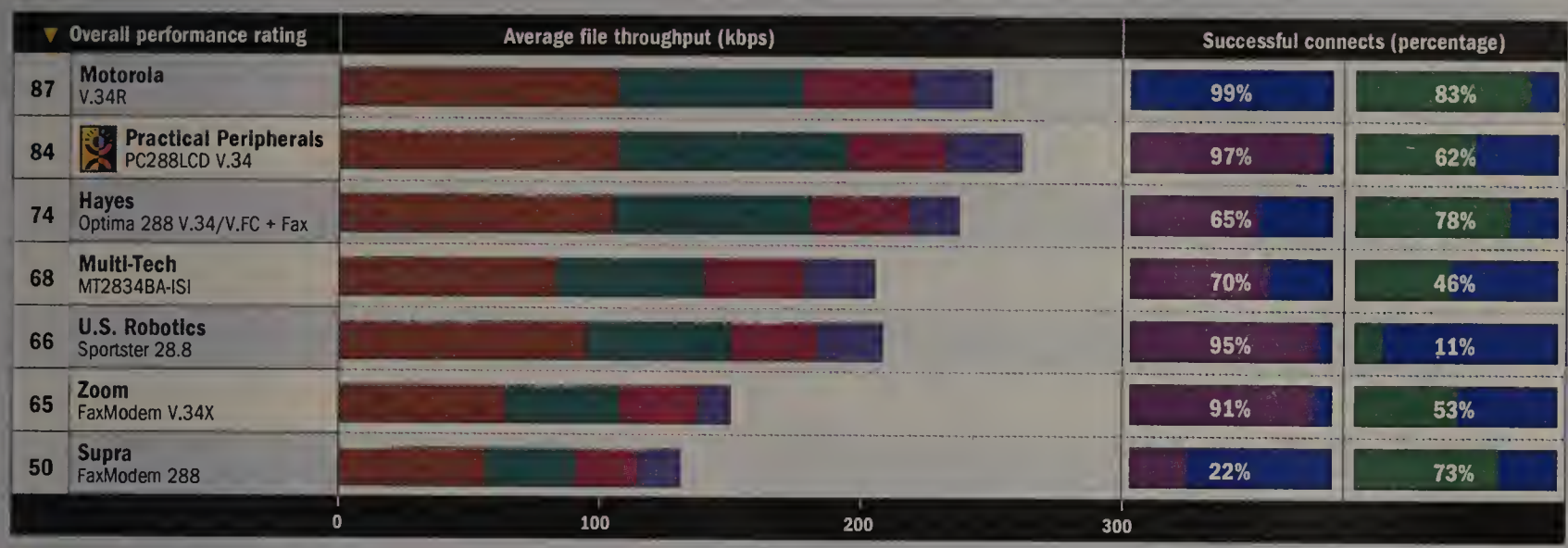
1-800-896-4898

400B Pierce Street, Somerset, NJ 08873 Tel: (908) 563-4166, Fax: (908) 563-0407

*The Triton PCI Chip Set, and the ATI MACH PCI Accelerator is only available on selected advertised Models. *All Pentium systems come with 256KB cache; 486DX2/66,486DX4/100 systems come with 128KB ca standard. Some software packaging may be cosmetically different than pictures shown. CD Titles do not include Manuals. On-Site Service may not be available in certain remote areas. All returned items must have a Re Merchandise Authorization (RMA) number and must be in original packaging. The cost for returned freight is not included with any Money-Back Guarantees; shipping charges are non-refundable. Due to volatility of prices, Qua does not offer a price protection policy. Prices and product descriptions subject to change without notice.Quantex Microsystems cannot be responsible for errors in typography or photography. The Intel inside Logo, IntelDX2, Pentium are trademarks of Intel Corporation. Some of the names or trademarks shown herein may be the property of other companies. Screen images simulated. Quantex 1995. All Rights Reserved.

Test Report

MOTOROLA'S V.34R: BEST PERFORMER IN THIS ROUNDUP



BEST BUY

Modems are arranged in order of overall performance from best to worst, based on the total of the scores from weighted tests.

Graphics file | Word processing file | .exe file | Compressed file

Percentage of connect attempts that were successful | Of successful connects, percentage at 28.8 kbps

Methodology
We used a simulated public service telephone network from Processing Telecom Technologies to test each modem pair. The PSTN simulated 55 line conditions, representing 95 percent of all domestic phone lines as defined in TIA/EIA 37A (TSB-37A). Each modem used a vendor-provided initialization string that meets TSB 38 requirements. We performed 220 transfers using graphics, text, executable, and precompressed files. We transferred files between a pair of identical modems. For the fax test, we sent a file to a fax machine using Delrina's WinFax Pro 3.0 program.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

the attempts made. Were it not for its poor performance, the FaxModem 288 might have had a shot at a Best Buy. *Supra Corp., 800/727-8772, 503/967-2400.* **Reader service no. 605**

U.S. Robotics Sportster 28.8

PROS: Very good price, handy external controls, decent documentation, responsive tech support
CONS: Few top-speed connections

This tiny white Sportster may not look like much, but there's much to commend it. For example, the unit's $339 price is exceptionally low for a 28.8-kbps modem, especially one that comes from a highly regarded company and is backed with very good support, complete with a long warranty and generous support hours, weekends included. It comes with good documentation, including an easy-to-follow user's manual and a quick-start guide that has an extensive troubleshooting section. And the power switch and volume controls are conveniently located on the front and side of this unit. The modem also includes QuickLink II fax/data software.

Drawbacks? The Sportster 28.8 comes with no security features, nor can you store multiple configurations. Even more egregious is the modem's poor record for establishing high-speed connections. While this unit achieved successful connections in at least nine out of every ten attempts, only one out of those connections resulted in a 28.8-kbps link. The Sportster 28.8 would have had a good shot at a Best Buy were it not for its middling test scores. *U.S. Robotics, 800/342-5877, 708/676-7010.* **Reader service no. 606**

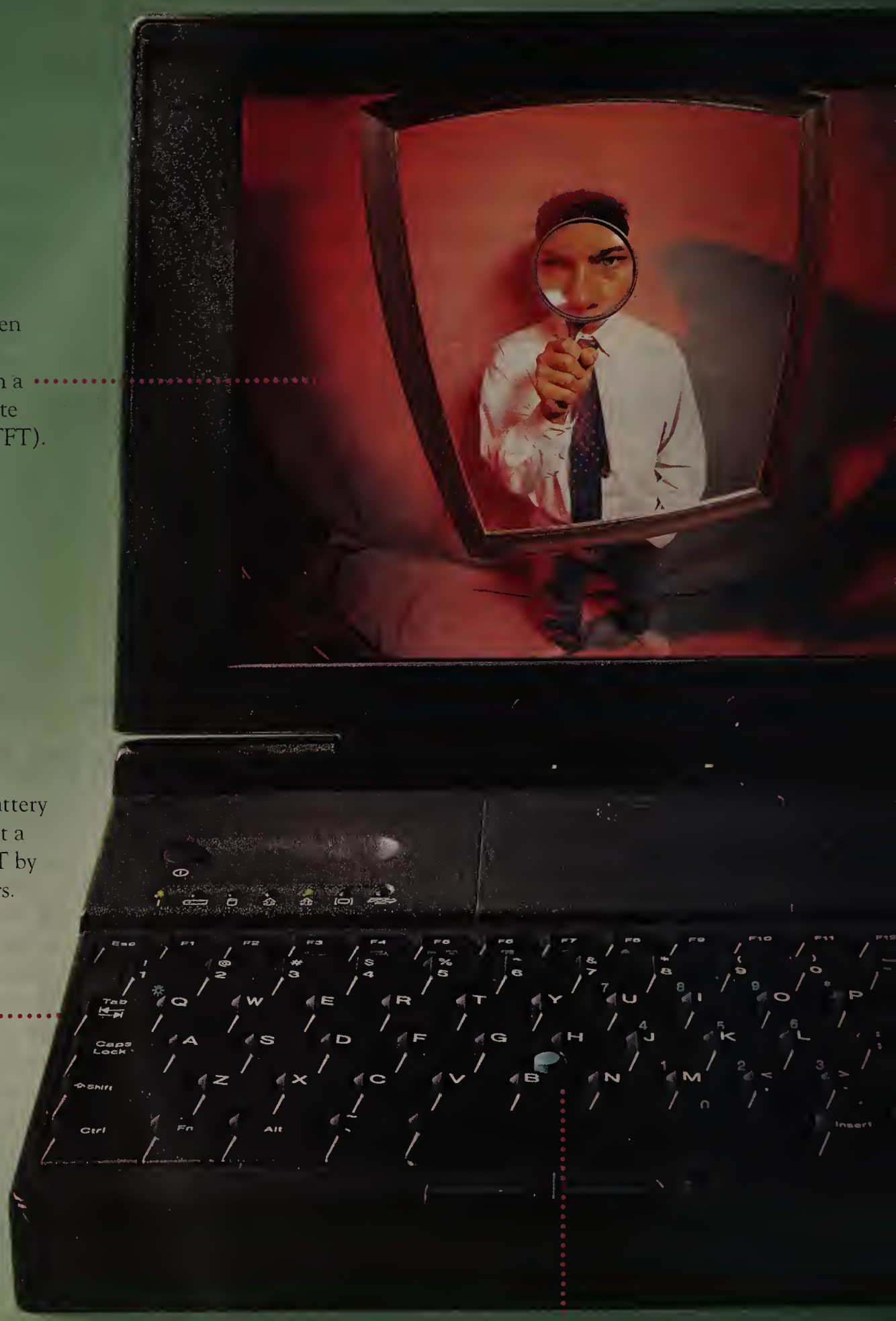
Zoom FaxModem V.34X

PROS: Excellent price, easy-to-read documentation, support for cellular data, long support hours
CONS: Ho-hum performance, no status readout, no telephone switch-off during data transfer

The Zoom FaxModem V.34X, like the Supra model reviewed here, has a price that's hard not to like. At $269, you won't find V.34 modems much cheaper. And that modem is backed by a full seven-year warranty and some of the longest tech support hours available among the modem vendors. It is also accompanied by a complete and detailed user's manual and an easy-to-follow quick-start guide. The Zoom comes from one of the more reputable manufacturers in the business and is bundled with ComIT data communications software and the popular WinFax Lite and DOS-Fax Lite programs.

But yes, there are also some significant catches. The Zoom lacks many user conveniences—it has only LED status lights and rear-mounted switches, and no external volume controls. Plus, it fails to automatically disable its phone jack during a modem connection, which means that someone inadvertently picking up the phone could trash a file transfer. The modem's most severe limitation, however, is its lackluster performance. While the Zoom did noticeably better than the Supra in our benchmarks, it still came in second to last, achieving 28.8-kbps speeds in only half the connects it was able to establish. In short, as in most of life, you get what you pay for. *Zoom Telephonics, 800/666-6191, 617/423-1072.* **Reader service no. 607**

WHAT TO LOOK FOR IN A TOSHIBA, COMPA



See how the screen measures up against the one in a Compaq LTE Elite (10.4"TFT vs. 9.5"TFT).

The lithium ion battery will easily outlast a Toshiba T4850CT by over three hours.

With the SmartPoint trackstick your hands never have to leave the keyboard. Try that with a Toshiba T4850CT external trackball.

intel inside

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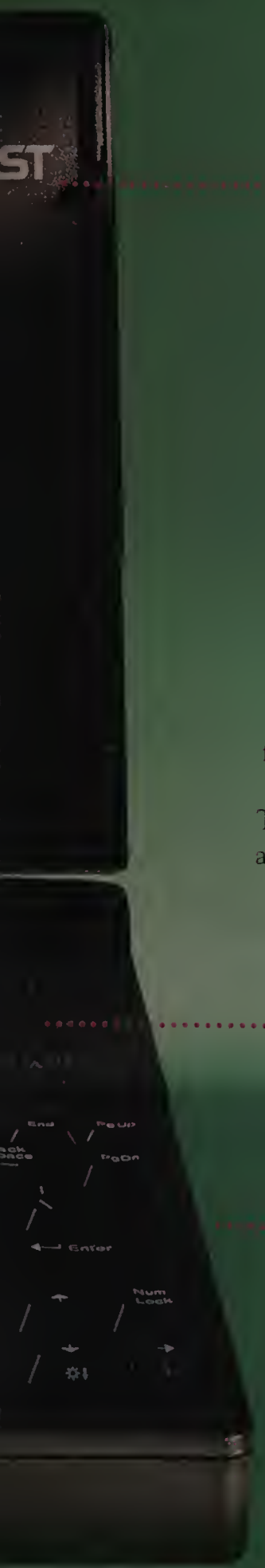
ND IBM NOTEBOOK.



No sticker shock here. The 910N costs less than the IBM ThinkPad 755C.

On the road, even a few ounces can make a big difference. The 910N is over half a pound lighter than a Compaq LTE Elite.

Standard memory, you ask? The 910N features 8MB RAM, compared to the 4MB RAM in the IBM ThinkPad 755C.

With all the choices out there, you're probably asking yourself, "What to buy? What to buy? What to buy?"

Well, maybe this will help. Pictured to your left are a few comparisons to illustrate how the new AST Ascentia 910N stacks up against the field.

The 910N gives you the muscle of the Intel 486DX4/75MHz processor. Just imagine this kind of power and speed to crunch your facts and figures.

To see what's going on, there's a 10.4" TFT active-matrix color screen for crisp graphics. And on a single charge, the lithium ion battery lets you work six to ten hours.

As with every Ascentia notebook, the 910N comes with a 3-year worldwide limited warranty.* For a little extra reassurance, we provide a 48-hour repair service** and around-the-clock telephone support. It's what you'd expect from one of the world's largest computer makers.

Phone 1-800-876-4AST and we'll tell you where to find the Ascentia 910N. Now that you know what to look for.

YOU'LL LIKE THE WAY WE WORK™

Ascentia 910N

Intel 486DX4/75MHz or DX2/50MHz processors

10.4" diag. TFT active matrix or 10.3" DS-STN color display

340MB, 510MB or 700MB removable hard drive

8MB RAM, upgradable to 32MB

PCMCIA slots - Two Type II or one Type III

Lithium ion battery: 6-10 hours use

Weight: 6.1 lbs.

AST® COMPUTER

*tel Inside logo is a registered trademark of Intel Corporation. All other product or -in basis to the nearest AST-authorized service provider. **For one year in U.S. only*

Circle 87 on reader service card

Features Comparison

V.34: SURPRISINGLY AFFORDABLE

● = Yes ○ = No
n/a = not available

	Optima 288 V.34/V.FC + Fax	V.34R	MT2834BA-ISI	PC288LCD V.34	FaxModem 288	Sportster 28.8	FaxModem V.34X
Company	Hayes	Motorola	Multi-Tech	Practical Peripherals	Supra	U.S. Robotics	Zoom
List price	$579	$595	$799	$459	$265 [1]	$339	$269
Chip set	Rockwell	Motorola	AT&T	Rockwell	Rockwell	U.S. Robotics	Rockwell
Maximum data rate (kbps)	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Maximum fax rate (kbps)	14.4	14.4	14.4	14.4	14.4	14.4	14.4
Internal version	$499	n/a	n/a	n/a	$245	$279	$239
Data dictionary (K)	8	2	2	8	2	2	4
Data protocols							
V.34 (28.8 kbps)/V.fc (28.8 kbps)/V.32ter (19.2 kbps)	●/●/○	●/○/○	●/○/●	●/●/○	●/●/○	●/●/○	●/●/○
Class 1	●	●	○	●	●	●	●
Class 2.0	○	○	●	●	●	●	●
Bundled software							
Data communications	Smartcom LE	WinCom Lite/ ComIT	MultiExpress	QuickLink II	ComIT	QuickLink II	ComIT
Windows/DOS	●/○	●/●	●/○	●/●	●/●	●/●	●/●
Fax communications	Smartcom Fax	FaxTalk Plus	MultiExpress Fax	QuickLink II	FaxTalk Plus	QuickLink II	WinFax Lite/ DOSFax Lite
Windows/DOS	●/○	●/●	●/○	●/●	●/●	●/●	●/●
Features							
Status panel readout	○	○	○	●	●	○	○
Phone shutoff during modem connections	●	●	●	○	○	●	○
Power switch location	back	back	back	front	front	front	back
Multiple profiles stored	2	9	○	○	2	○	2
Remote configuration	○	●	○	●	○	○	○
Manual volume control	○	○	●	●	○	●	○
Security							
Callback	○	●	●	○	●	○	○
Passwords	○	●	●	○	●	○	○
Caller ID detection	○	○	○	●	●	○	● [2]
Printed documentation							
Beginner's guide/quick-start guide	○/○	○/○	○/○	○/●	○/●	○/●	○/●
Troubleshooting guide	●	○	○	●	●	●	●
Glossary/Index	○/○	○/○	○/●	○/●	●/●	○/○	●/●
Documentation rating (1 = poor, 5 = excellent)	2	2	2	4	3	3	3
Service and support							
Warranty (years)	5	2	5	lifetime	5	5	7
30-day money-back guarantee	○	○	○	●	● [3]	●	○
Toll-free number	○	●	●	○	○	○	○
Weekday support hours	9	9	9	17 [4]	11	12	14 [4]
Unlimited phone support	●	●	●	●	●	●	○
BBS	●	●	●	●	●	●	●
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BEST BUY

[1] Vendor-estimated street price.
[2] On external version only.
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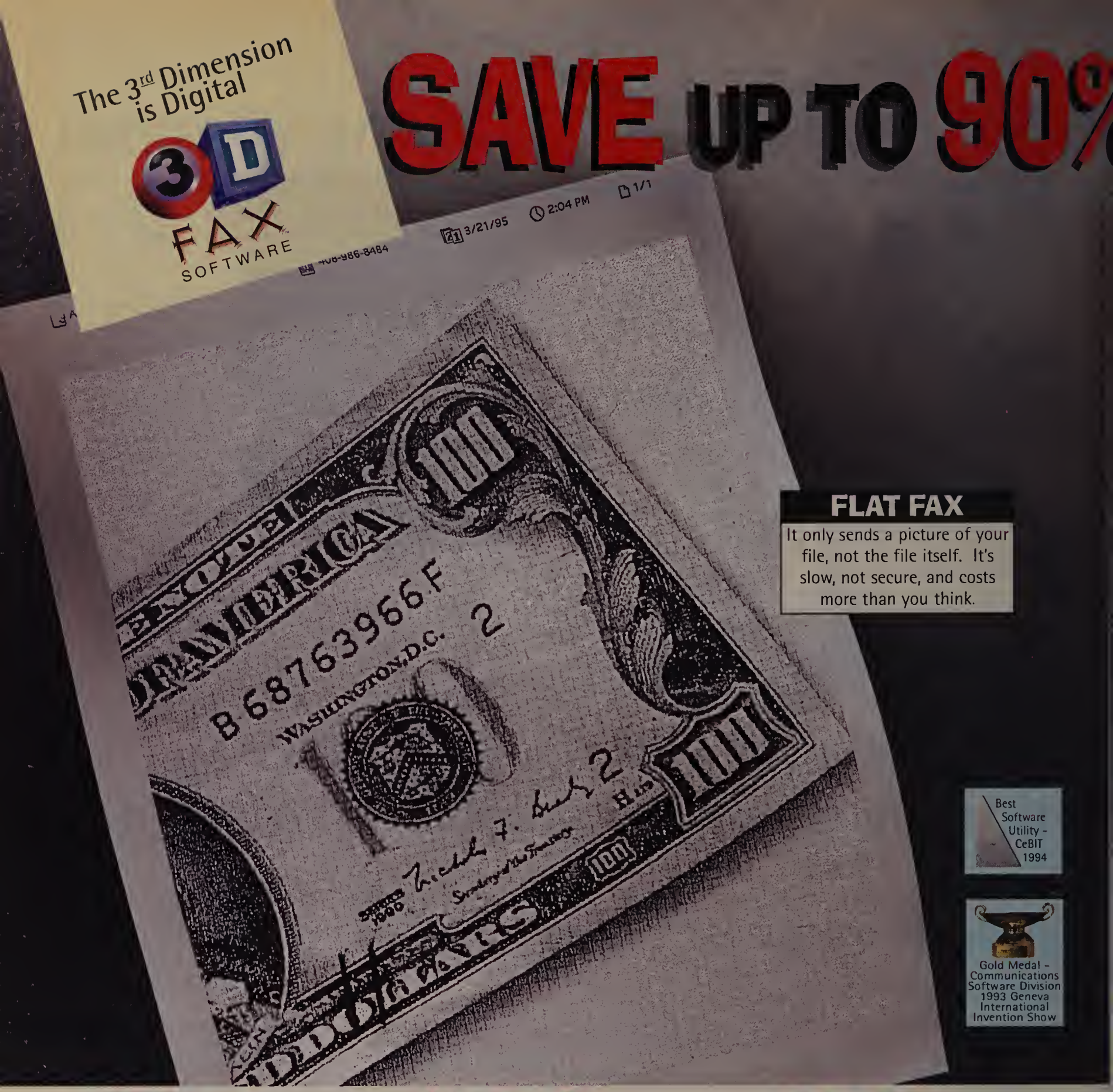

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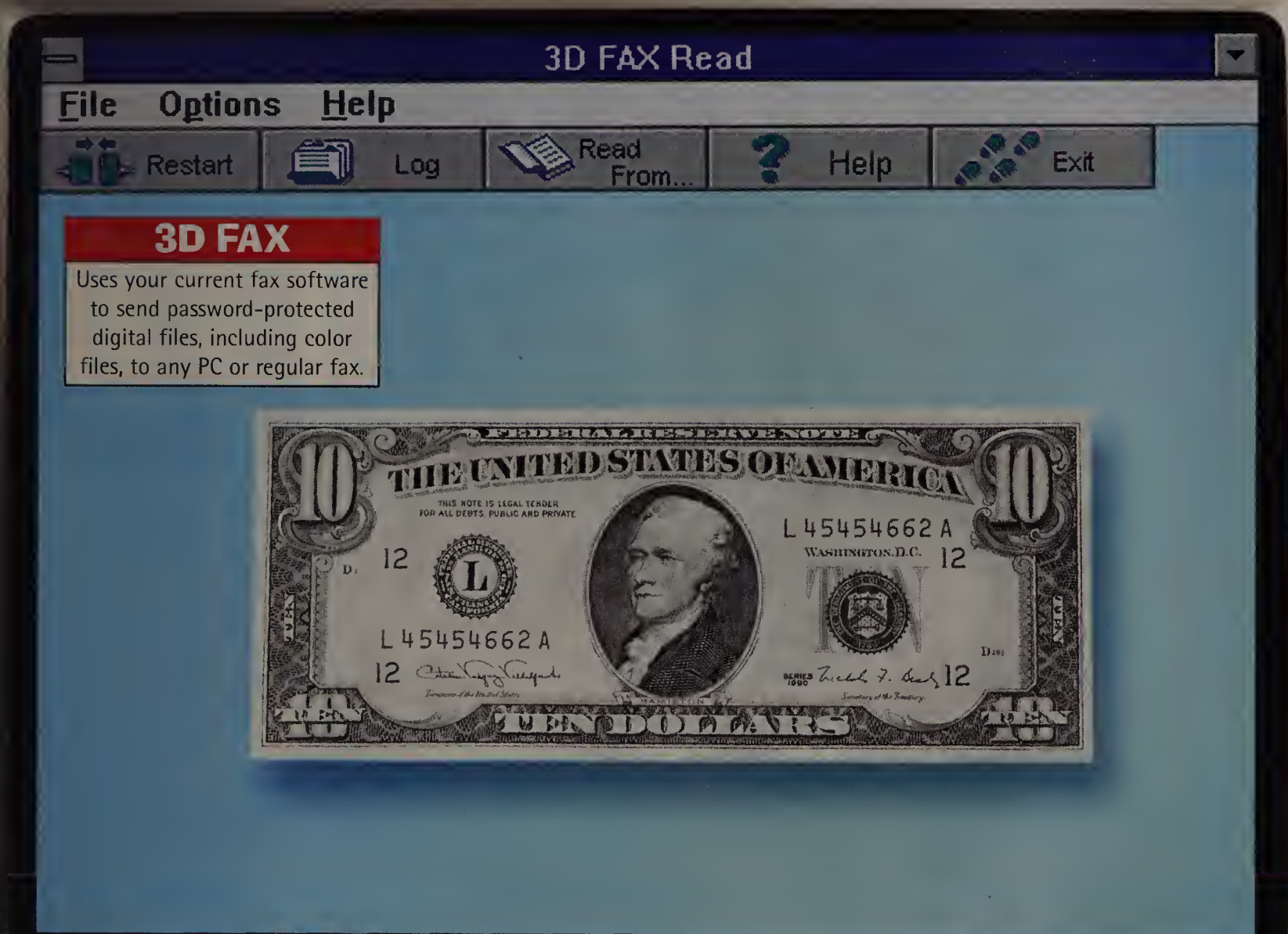

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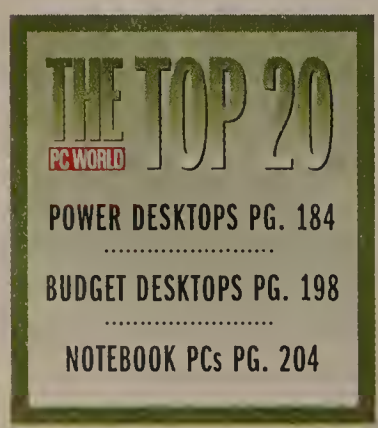
TOP 20 PCs CLOCKING IN AT 120 MHz

PENTIUM-120s TAKE THE DESKTOP BY STORM, WITH FOUR OF THE FIRST FIVE SYSTEMS—LED BY DELL'S DIMENSION XPS P120C—WINNING BEST BUYS. OTHER CHART TOPPERS THIS MONTH: MICRON'S 4100 MAGNUM, AST'S ASCENTIA 910N, AND WINBOOK'S XP SX-33. BY REX FARRANCE AND MELISSA RIOFRIO

Today your PC faces a tough job. Windows word processors and spreadsheets are already pushing systems to the limit, and multimedia and graphics apps can be even more demanding. How do you buy a PC now and make sure your next software upgrade won't plunge it into instant obsolescence?



Clearly, you need every bit of performance you can afford. Pentium-100s provide a nice edge over popular Pentium-90s. But hot Pentium-120s are your best bet yet to get the speed you'll need in the years to come. Just be prepared to pay a premium.

This month we review the first five 120-MHz Pentiums available. The two fastest—the Gateway 2000 P5-120 and Micron P120 Millennia—provide an impressive 20 percent boost over typically fast 100s, making them the fastest Windows machines we've ever seen. The other 120s weren't quite as fast: The Dell Dimension XPS P120c was only about 10 percent quicker than a typical Pentium-100, and the HP Vectra VL3 5/120's numbers look like a fast 100's. The fifth 120-MHz system, Zeos's Pantera P-120, uses a highly expandable motherboard utilizing Intel's older Neptune core logic. It performed about like a Pentium-90 and didn't make our chart. But rumor has it that a far faster Zeos with a brand-new motherboard will be available for review soon.

Pentium-120s aren't all the news. Our power chart gains five other new members: two Pentium-100s, a Pentium-90, and two Pentium-75s. You'll find these first-timers reviewed this month.

MARC SIMON

PENTIUM-120s—AN IMMEDIATE HIT. Clockwise from top are the Gateway 2000 P5-120, Dell Dimension XPS P120c, HP Vectra VL3 5/120, and Micron P120 Millennia.

Pentium-120: A Star Is Born

With Pentium-120s costing up to $500 more than comparable Pentium-100s, it takes a lot to compensate for the extra cash. Fortunately, our Best Buy 120s, from Dell, Micron, Hewlett-Packard, and Gateway, deliver a range of features that will appeal to everyone from demanding business users to flat-out power freaks.

The pricey Best Buy Dell Dimension XPS P120c costs $4689. But it puts together a top-rated combination, including a prodigious 1624MB Enhanced IDE hard drive and a solid multimedia configuration. The 4MB 128-bit graphics controller quickly renders color-saturated graphics at the high resolutions you'll be using on its 17-inch monitor. And Dell's reliability and service are great.

A shade behind the Dell in overall rating, Micron's P120 Millennia serves up near record performance, landing in a virtual dead heat with the Gateway 2000 P5-120. The Millennia is helped by 16MB of fast Extended Data Output (EDO) RAM, which works with the system's Pentium-tuned Intel Triton chip set to reduce the idle time the CPU spends waiting for instructions. In addition, the Millennia uses 256K of Micron's SyncBurst secondary cache, which the company says dramatically cuts access times to data in the cache. The Gateway Pentium-100 and Pentium-120 systems in this review also use EDO RAM and the enhanced secondary cache. The Millennia has a generous 1278MB hard drive and a quad-speed CD-ROM drive for a dead-reasonable price of $3799.

The third-place HP Vectra VL3 5/120 provides a squeaky-clean internal layout, a three-year warranty, and superb reliability. Our last Pentium-120 Best Buy, the Gateway 2000 P5-120, takes a nominal edge over the Micron for fastest PC on earth. For $4299, you get a 17-inch monitor, a 1624MB hard drive, and a unique quad-speed CD-ROM changer—the first we've seen in a desktop. You load three discs at a time and let the drive do the shuffling.

Top 20 Notebooks, Budget Desktops Hold Firm

Compared to the power desktops chart, our Budget Desktops and Notebook PCs Top 20s were rocks of stability. Just one of this month's contenders, the number 13 Vektron PCI Power Station P-90, climbed aboard our budget desktops list. Priced at $2195, it's a quick, no-frills Pentium-90 with 16MB of RAM and an 850MB hard drive. Thanks to a $200 price drop, the Micron 4100 Magnum—with an impressive ninth appearance on the chart—vaults back to the number one position and a sixth budget Best Buy.

On our notebooks chart, AST's classy Ascentia 910N, reviewed in April, catapults to the top of the power chart on the strength of a new three-year warranty, a hefty price drop of over $500, and a battery life of almost 8 hours. The powerful but pricey Toshiba T4900CT Pentium-75 drops to number two, barely staving off the challenge of Dell's Latitude XP 4100CX. Of this month's contenders, the innovative Pentium-75 NEC Versa P/75HC shows off a superb 800 by 600 active-matrix color screen—a first on our notebooks chart. Digital's 5.8-pound HiNote Ultra CT475 boasts a trim modular design, while WinBook's XP DX4-100 8/520 TFT is a well-priced power DX4-100. Meanwhile, the WinBook XP SX-33 Monochrome tops the budget heap for the second month, despite a very stiff challenge from the Compaq Contura 400c, which glides onto our budget list on the wings of a big $500 price reduction.

The Fast Shall Be First

As usual, we've kept prices and configurations updated on all previously reviewed Top 20 systems, along with Top 20 reliability and service ratings. Every PC that makes our charts is one of the finest values available. With that in mind, we'll *still* understand if your attention goes first to the fastest: the brand-new Pentium-120s.

Rex Farrance is an associate editor and Melissa Riofrio an assistant editor for PC World. *They can be reached on PC World Online (see page 12 for contact information). Staff members John Goddard, Anita Hamilton, Arden Hoffman, Susan Silvins, and Kirk Steers and freelancer Geoffrey Coffey contributed to this article. Testing by Dave Casini and Susan Silvins; research and support by Mike Salayko.*

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Unless you already have a credit arrangement with the vendor, use a credit card for all orders. The credit card company can help mediate any disputes that arise or can give you a refund if you fail to receive a product you've paid for.

Leave room for memory upgrades.
Before buying a PC, make sure you can upgrade RAM without having to discard SIMMs. Some systems lack free SIMM sockets when configured with 4MB, 8MB, or even 16MB of RAM. Ensure a less pricey upgrade path by asking for high-capacity SIMMs and free sockets.

Ask for a 4X CD-ROM drive.
Many PC vendors are currently switching CD-ROM drive offerings from double speed to quadruple speed. Even while clearing inventory on the slower drives, most firms have the faster units as another option. Chances are you'll pay as little as $25 more for the faster drive.

Know your multimedia options.
Some PC vendors offer a range of options on sound cards and speakers. If you want top-quality sound on your system, you should buy the best with your PC and save yourself the added cost and aggravation of a later upgrade.

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THE TOP 20

PC WORLD POWER DESKTOPS

1 **Dell Dimension XPS P120c**
Nothing compromised on pricey 120.

	Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1 Dell Dimension XPS P120c	–	1	current	81	102	71/73	$4689	Pentium-120	16	1624
2 Micron P120 Millennia	–	1	current	80	111	65/69	$3799	Pentium-120	16	1278
3 HP Vectra VL3 5/120	–	1	current	78	90	78/73	$3700	Pentium-120	16	853
4 Dell Dimension XPS P90	1	4	Mar 95	78	83	71/73	$3233	Pentium-90	16	1083
5 Gateway 2000 P5-120	–	1	current	76	113	58/61	$4299	Pentium-120	16	1624
6 Dell OptiPlex XMT 590	2	6	Jan 95	76	82	71/75	$3419	Pentium-90	16	1083
7 Micron P90 PowerStation	3	5	Feb 95	75	86	65/69	$3199	Pentium-90	16	1083
8 Gateway 2000 P5-100XL	–	1	current	75	111	58/61	$3799	Pentium-100	16	1083
9 Dell OptiPlex XMT 5100	5	2	May 95	75	83	71/75	$4059	Pentium-100	16	1083
10 Dell Dimension XPS P100	4	4	Mar 95	75	77	71/73	$3887	Pentium-100	32	1083
11 Digital Celebris XL 590	6	2	May 95	75	86	75/73	$5500	Pentium-90	16	1050
12 NEC PowerMate VP75	–	1	current	72	69	64/71	$2924	Pentium-75	16	1278
13 Quantex QP5/90 W-3	7	4	Mar 95	72	79	58/67	$2997	Pentium-90	16	1083
14 USA Flex PT90 MidTower	9	2	May 95	72	84	[2]	$3729	Pentium-90	16	1083
15 Gateway 2000 P5-75	–	1	current	72	83	58/61	$2499	Pentium-75	16	730
16 Micron P90 Home MPC	8	6	Jan 95	72	79	65/69	$2499	Pentium-90	8	528
17 Acma P100	–	1	current	71	93	[2]	$3699	Pentium-100	16	853
18 Compaq Deskpro XL 590 Model 535/MX	–	1	current	71	76	81/77	$4798	Pentium-90	16	540
19 DFI Diamond P90	11	5	Feb 95	71	84	[2]	$3395	Pentium-90	16	1083
20 Tagram Thunderbolt XL	14	5	Feb 95	71	86	[2]	$2672	Pentium-90	16	540

BEST BUY

[1] Call 800/434-4495 (for payment by Visa or MasterCard) or 900/993-2972 (for telephone billing) and use the fax reprint numbers listed above to order fax copies of system reviews. You can order three systems' capsule reviews ($4.95), a single capsule review plus features table and test report ($4.95), an entire month's review ($9.95), and a list of all systems tested by the PC World Test Center ($4.95). In addition, you can order next month's Top 20 charts and capsule reviews In

2 Micron P120 Millennia
Superfast 120 at a good price.

3 HP Vectra VL3 5/120
Basic 120: super reliability, price.

4 Dell Dimension XPS P90
Only Pentium-90 Best Buy holdover.

5 Gateway 2000 P5-120
Hot 120's loaded but not cheap.

CD-ROM drive	Bus slots	Monitor size/ dot pitch	Vendor contact number	Fax reprint number [1]	Reader service no.	Comments (Recommended as home system)
4X	ISA, PCI	17"/.26	800/613-3355	3241	635	Great reliability and service boosts Pentium-120 with big monitor and hard disk, and high price.
4X	ISA, PCI	15"/.28	800/223-6571	3242	634	Multimedia unit is about as quick as they come, with fast EDO RAM and all the right stuff.
2X	ISA, PCI	15"/.28	800/752-0900	3243	636	Slowest Pentium-120 on chart, but great service and reliability and reasonable price do it for HP.
4X	ISA, PCI	15"/.28	800/613-3355	3202	637	Last month's no. 1 is the only remaining Pentium-90 Best Buy.
4X	ISA, PCI	17"/.26	800/846-2000	3244	638	Big price, top performance, EDO RAM, CD-ROM changer, giant hard drive and monitor.
2X	ISA, PCI	15"/.28	800/613-3355	3173	639	Corporate version of the XPS P90 design costs more, has better expandability and warranty.
2X	ISA, PCI	15"/.28	800/223-6571	3184	640	Still a successful blend of power, price, and features—solid value for the money.
4X	ISA, PCI	15"/.26	800/846-2000	3245	641	EDO RAM helps give this Pentium-100 fantastic performance.
2X	ISA, PCI	15"/.28	800/613-3355	3222	642	Corporate PC costs more, has better expandability and warranty than Dimension XPS P100.
2X	ISA, PCI	15"/.28	800/613-3355	3203	643	The 100-MHz version of the two Best Buys. Disappointing performance despite 32MB of RAM.
2X	ISA, PCI	17"/.26	800/722-9332	3223	644	Excellent Pentium-90 performance from vendor that ranks near top for reliability and service.
4X	ISA, PCI	15"/.28	800/632-4636	3246	645	Good fit and finish, large hard drive in basic power business box from good service provider.
2X	ISA, PCI	17"/.26	800/896-4898	3200	646	Solid, loaded multimedia system with big monitor. Slow for a Pentium-90.
4X	ISA, PCI	17"/.26	800/872-3539	3224	647	Serious home and multimedia Pentium-90 with a 17-inch monitor.
4X	ISA, PCI	15"/.26	800/846-2000	3247	648	Impressive performance from Pentium-75 overachiever. Power boxes don't come much cheaper.
2X	ISA, PCI	14"/.28	800/223-6571	3172	649	Great home PC, but more RAM would help so-so performance.
4X	ISA, PCI	17"/.28	800/786-6888	3248	650	Hot-performing Pentium-100 has great graphics controller with 4MB of VRAM and big monitor.
—	EISA, PCI	17"/.28	800/345-1518	3249	651	Basic power business EISA PC, top service, reliability—but small hard drive and no CD-ROM drive.
2X	ISA, PCI	17"/.26	800/808-4334	3188	652	Solid Pentium-90 home system, but vendor lacks toll-free tech support line.
4X	ISA, PCI	15"/.28	800/824-7267	3187	653	Excellent Pentium-90 performance, attractive price. Could use a bigger hard drive.

advance (The Top 20 Flash Report, $9.95; available May 23). Touch-tone phone required. [2] Insufficient customer responses to our Reliability and Service Monitor to gauge service performance and reliability. For our overall evaluation, we use an average rating derived from all companies for which we have received fewer than 100 responses.

For more information about all products in this table, circle reader service no. 907.

Top 20 Power Desktops

FOUR OF THE FIVE FIRST PENTIUM-120 SYSTEMS went straight to the top of our power chart this month. The Gateway and Micron 120s are the fastest PCs we've ever tested, and both these Best Buys feature extrafast EDO RAM. In addition, the Gateway and the Dell have 1624MB hard drives, and the Gateway features a CD-ROM changer.

Dell's pricey Dimension XPS P120c is our new number one—thanks to a super configuration and fine reliability and service. A close number two, Micron's P120 Millennia is a stupendous performer. The Hewlett-Packard Vectra VL3 5/120's good price and fantastic reliability earn it number three. And Gateway's P5-120 turns amazing performance and a great configuration into a number five Best Buy. The only top-five holdover is last month's top gun—the Dell Dimension XPS P90—and it drops to number four. In all, nine new PCs debut this month. It's a great time to buy a power desktop.

1 Dell Dimension XPS P120c

NEW THIS MONTH

PROS: Fine performance, 17-inch monitor, 1624MB hard drive, 4MB 128-bit graphics controller

CONS: No free SIMM sockets, one-year warranty, seven-day repair turnaround, high price

Dell's Dimension XPS PCs always seem to move right into the Best Buy neighborhood on our power chart. This model, buoyed by its excellent performance and array of elegant extras, narrowly edges past the Micron P120 Millennia into the number one slot. As you might expect, this 120-MHz Pentium minitower runs significantly faster than a typical Pentium-100. Although the $4689 price is far from cheap, it does buy a very classy configuration.

For starters, you get 16MB of RAM, 256K of secondary cache, and a hulking 1624MB hard drive. The system offers a multimedia setup, including a quad-speed NEC CD-ROM drive. Dell even gives you a switch-hitting combo floppy drive, and the comfortable and sturdy Lexmark keyboard is a cut above the typical. The graphics controller is a beauty: a 128-bit Number Nine PCI card with 4MB of VRAM, a 100-Hz refresh rate at 800 by 600 resolution, and a maximum noninterlaced resolution of 1600 by 1200. As you'd expect, Dell matches the controller with a 17-inch monitor.

You get three free drive bays (two externally accessible), two free PCI slots, two free 16-bit ISA slots, and a slot you can fill with either a PCI or an ISA card. On the downside, Dell's RAM setup requires SIMMs to be installed in banks of two, and with this 16MB configuration, all four SIMM sockets are filled. We also found more cable clutter than we usually see in a Dell product.

Dell's service-and-support package for the Dimension series includes just a one-year warranty. However, you get toll-free 24-hour technical support and a year of on-site service. And according to readers responding to our ongoing fax-back survey, Dell ranks with the very best when it comes to service and reliability. We do think the company's seven-day turnaround policy on service center repairs is too long. As always, we found Dell's documentation thorough, clear, and well illustrated.

Dell

Despite the quibbles we have with this PC, it's one of the best systems we've seen yet. It's fast, with a configuration that will turn the head of any power user. Along with great support, isn't that just what you're looking for in a Best Buy Pentium-120?

2 Micron P120 Millennia

NEW THIS MONTH

PROS: Amazing performance, 1278MB hard drive, quadruple-speed CD-ROM drive

CONS: One-year warranty

Packed with value, the number two Best Buy Micron P120 Millennia uses Intel's latest hotshot CPU, the just-released Pentium-120. But the CPU isn't the only factor in the system's hot performance: The unit's 16MB of fast EDO RAM works in concert with the Intel Triton chip set and the 256K of Micron SyncBurst cache to outperform everything we've ever tested—with the sole exception of the imperceptibly faster Gateway P5-120. And the system comes with a hefty 1278MB hard drive. Not bad for $3799. Good enough, in fact, to make a tremendous run for first place.

The 2MB 64-bit Diamond Stealth PCI video card is solid, although its maximum 1280 by 1024 resolution would shrink text to near the point of unreadability on the included 15-inch ADI monitor. Though the display has strong specs, ADI units performed just so-so in our April review "Big Screens." We prefer the Mag monitors Micron also typically offers (depending on supply). The Millennia includes a quad-speed CD-ROM drive, a sound card, speakers, and Microsoft's Office Pro, Bookshelf, and Assistant.

Micron

This minitower provides surprising expandability in four free drive bays (two externally accessible), two free PCI slots, two free 16-bit ISA slots, and a slot for a PCI or a 16-bit ISA card. The 16MB RAM configuration leaves two SIMM sockets free. Micron's tech support works six days a week, and the company earns good marks from readers responding to our ongoing fax-back survey. The only downside to Micron's support is its one-year warranty. Service is one clear area of differentiation between this Best Buy and the number three HP Vectra VL3

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5/120: The HP comes with a long warranty and virtually unbeatable service; the Micron performs better and has a stronger configuration. This PC is a terrific deal—especially if your budget tops out under $4000. If you can spend a bit more, order it with a larger monitor and a warranty extension. Any way you go, you'll get top performance, a large hard drive, and a great software bundle.

HP Vectra VL3 5/120

NEW THIS MONTH

PROS: Excellent design, top-ranking service and support

CONS: Although it's fast, the performance numbers are more like a quick Pentium-100's

Hewlett-Packard's Vectra VL3 5/120 offers generally good performance and superb design. Though it lacks full multimedia features, this refined compact desktop is solidly configured for most business tasks. With 16MB of RAM expandable to 192MB and 256K of secondary cache, this 120-MHz Pentium easily surpassed Pentium-90s and was faster than all but the quickest Pentium-100s. But it fell behind the Dell, Gateway, and Micron 120s reviewed this month. This was an early system, however, and it's quite possible that by the time you read this, HP will have its units better tuned. As tested, the Vectra's good $3700 price and other fine features are enough to make it a solid number three Best Buy.

HP

The compact design provides fair expandability in as clean a layout as we've seen—the very antithesis of clutter. Every cable is crisply folded and neatly dressed to the exact length needed. There's room to add two hard drives, two ISA boards, one PCI board, and an extra PCI or ISA board. There are four free SIMM sockets available for memory upgrades but no free externally accessible drive bays.

The HP comes with an 853MB Enhanced IDE hard disk and a double-speed caddy-feed Sony Enhanced IDE CD-ROM drive. The system's integrated 32-bit PCI graphics controller provides adequate business graphics performance and good refresh rates, but its memory is already maxed out at just 2MB. The 15-inch monitor is a business basic.

The documentation is outstanding, and HP's service ranks high on our Reliability and Service Monitor—only Compaq rates slightly higher. You get a three-year warranty, 24-hour tech support, and HP's deservedly famous on-site service. This isn't the fastest Pentium-120, and its configuration is basic. But a realistic price, superlative design, and super support make it a solid Best Buy.

Dell Dimension XPS P90

REVIEWED: March 1995

PROS: Fast Pentium-90 performance, big hard drive

CONS: One-year warranty

Nicely expandable $3233 Pentium-90 minitower has 16MB of RAM, a 1083MB hard drive, a quadruple-speed CD-ROM drive, a 4MB 32-bit PCI graphics controller, and a 15-inch monitor.

Gateway 2000 P5-120

NEW THIS MONTH

PROS: Amazing performance, 1624MB hard drive, 17-inch monitor, three–CD-ROM changer

CONS: High price, no established repair turnaround policy, documentation lacks detail

This tower Pentium-120 is the hottest PC ever to grace our pages. With 16MB of extrafast EDO RAM and 256K of enhanced secondary cache, it's actually a hair's breadth faster than the spectacular Micron P120 Millennia. The configuration should fulfill any power user's dreams—of course, at $4299, you're paying the price.

The new 1624MB Western Digital Caviar hard drive helps redefine users' expectations of jumbo Enhanced IDE hard drives. And the Gateway Vivitron monitor is a beautiful 17-inch Trinitron display. (Trinitron tubes generally produce the sharpest displays available.) A solid 64-bit ATI GX Mach 64 PCI graphics controller with 2MB of VRAM upgradable to 4MB lets you use resolutions up to 1280 by 1024.

Gateway P5-120

The P5-120's unique multimedia setup features a quad-speed CD-ROM changer—a real convenience for those who get tired of manually shuffling CD-ROMs. The sound card supports high-quality wave-table recording and playback. You also get a 14.4/28.8-kbps fax-modem. Gateway even throws in Microsoft Office.

You get five free drive bays, two free PCI slots, one free 16-bit ISA slot, and another slot that takes a PCI or an ISA card. Two of the four SIMM sockets remain free for memory upgrades. Strong support policies include a three-year warranty and tech support six days a week. Gateway's scores on reliability and service from our reader fax-back survey run about average. Any *PC World* Best Buy is a tremendous value, but some systems' attractions make them more than just fine deals. With its superior performance and awesome configuration, the P5-120 is just that kind of PC.

Dell OptiPlex XMT 590

REVIEWED: January 1995

PROS: Terrific Pentium-90 performance, nice-size 1083MB hard drive, three-year warranty

CONS: Seven-day wait on service center repairs is much longer than competitors' turnarounds

Micron P90 PowerStation

REVIEWED: February 1995

PROS: Excellent Pentium-90 performance, 512K secondary cache, 1083MB hard disk

CONS: The one-year warranty is not that competitive today as a standard offering

Gateway 2000 P5-100XL

NEW THIS MONTH

PROS: Remarkable Pentium-100 performance, quadruple-speed CD-ROM drive

CONS: No free SIMM sockets, no established repair turnaround policy, manuals lack detail

This is by far the fastest Pentium-100 PC we've tested—it even outpaced some early Pentium-120s. How can a 100 perform this

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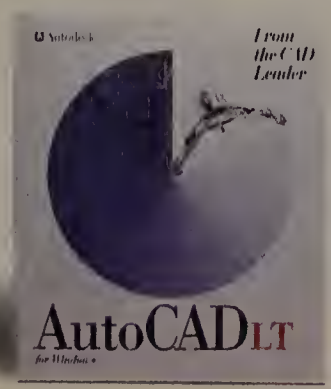

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well? A clue can be found in the system's 16MB of EDO RAM and 256K of enhanced cache. Any way you slice it, this is a power user's delight, decently priced at $3799. The big tower unit comes with a 1083MB hard drive, a quad-speed Mitsumi CD-ROM drive, a sound card, speakers, a 14.4-kbps voice-enabled fax-modem, and Microsoft's Office and Bookshelf.

Gateway doesn't stint on the graphics subsystem: You get a 64-bit ATI GX Mach 64 PCI graphics controller with 2MB of VRAM and a 1280 by 1024 maximum noninterlaced resolution. The company provides a high-quality Vivitron Trinitron monitor that matches these specifications, but practically you'll never use the highest resolution on a 15-inch display. You get six free drive bays (three externally accessible), two free PCI slots, and one free PCI or 16-bit ISA slot. It's too bad that none of the four SIMM sockets are free.

Gateway P5-100XL

Support policies are strong, with a three-year warranty and six-day-a-week tech support. Scores on our Reliability and Service Monitor run about average. The manuals lack Gateway's usual organization and detail. Despite the few flaws, the Gateway 2000 P5-100XL is an excellent system—a fine combination of hot performance and cool components.

9 Dell OptiPlex XMT 5100

REVIEWED: May 1995

PROS: Top-notch Pentium-100 performance, three-year warranty, ample1083MB hard drive

CONS: Unusually long seven-day turnaround on service center repairs

10 Dell Dimension XPS P100

REVIEWED: March 1995

PROS: Ultragenerous 32MB of RAM, jumbo hard drive, fine graphics controller

CONS: A bit pricey, not that fast for a Pentium-100, Dimensions have just a one-year warranty

11 Digital Celebris XL 590

REVIEWED: May 1995

PROS: Fast, capable of accepting a second Pentium-90 CPU, 1050MB hard drive

CONS: $5500 price is quite high for a Pentium-90 system

12 NEC PowerMate VP75

NEW THIS MONTH

PROS: 1278MB hard drive, quad-speed CD-ROM drive, excellent documentation, fine service

CONS: The $2924 price is higher than you will typically pay for a Pentium-75 system

This system gives you an attractive combination of good Pentium-75 performance and elegant design. Granted, $2924 is more than you'll pay for most Pentium-75s, but in exchange you receive a PC with a solid power configuration and a great warranty. The PowerMate comes with 16MB of RAM, 256K of secondary cache, and a massive 1278MB hard drive. Inside the minitower case, we saw evidence of NEC's usual good organization and attention to detail. You get three free drive bays (two externally accessible), one free PCI slot, two free 16-bit ISA slots, and one 16-bit ISA or PCI slot.

NEC

The video subsystem is solid basic fare. The integrated 1MB 64-bit PCI graphics controller supports up to 1280 by 1024 noninterlaced resolution and a refresh rate of 75 Hz at 800 by 600. The nice NEC MultiSync XV15 monitor matches these specs, though the top resolution's really too fine for the 15-inch display. You get a quad-speed CD-ROM drive—from Mitsumi rather than NEC—and a sound card, mike, and speakers.

The company's support policies are generous and include a three-year warranty and a promise to turn a repaired system around within one business day. Tech support is toll free but available only on weekdays. Readers responding to our ongoing fax-back survey rank NEC's reliability and service well above average, among the likes of AST, AT&T, IBM, and Micron. Finally, NEC's documentation is thorough and easy to understand. Add up the list of qualifications, and you wind up with an impressive value.

13 Quantex QP5/90 W-3

REVIEWED: March 1995

PROS: 16MB of RAM, 1083MB hard drive, 17-inch monitor, CD-ROM drive, 14.4-kbps fax-modem

CONS: A one-year warranty is a short standard offering these days, slight cable clutter inside

14 USA Flex PT90 MidTower

REVIEWED: May 1995

PROS: Impressive multimedia setup with quadruple-speed CD-ROM drive and wave-table MIDI sound card, large 17-inch monitor, very fast 4MB VRAM graphics controller

CONS: At $3729, a bit pricey for a Pentium-90; some cable clutter inside case

15 Gateway 2000 P5-75

NEW THIS MONTH

PROS: Extrafast Pentium-75 performance, quad-speed CD-ROM drive

CONS: Documentation lacks detail, crowded interior, no established service turnaround policy

With performance that would stack up well against that of many Pentium-90s, this $2499 Pentium-75 is a natural for those who want a fast system that doesn't cost an arm and a leg. Don't think you're getting a stripped-down model. The Gateway 2000 P5-75 comes equipped with 16MB of RAM, a 730MB hard drive, a quadruple-speed Mitsumi CD-ROM drive, and a sound card and speakers. The graphics subsystem is Gateway's usual solid offering: a 64-bit ATI GX Mach 64 PCI graphics controller with 2MB of VRAM. And the monitor is a nice 15-inch

Gateway P5-75

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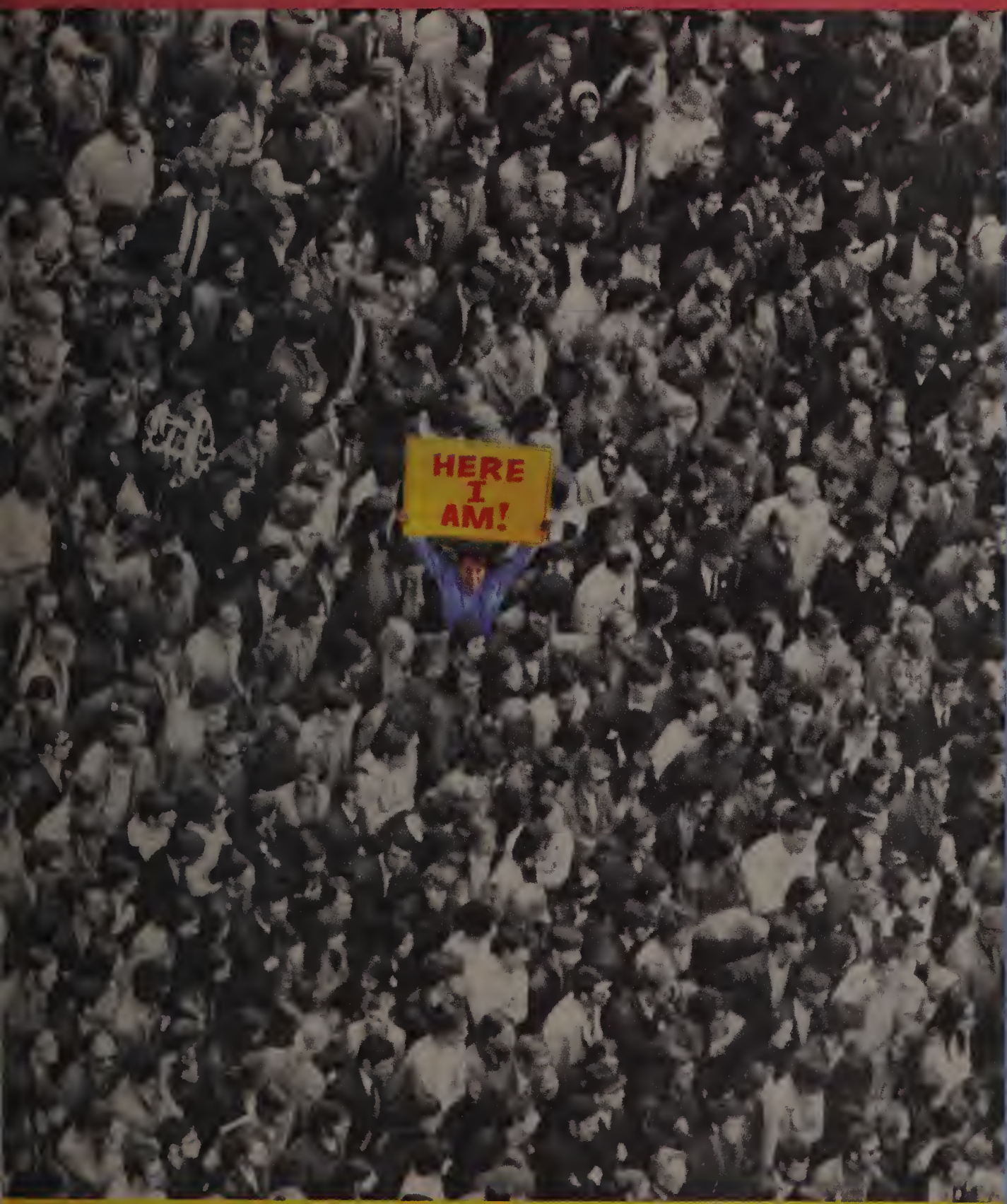

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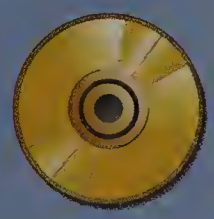

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Vivitron Trinitron model. The interior of the compact chassis on the P5-75 is fairly crowded, but you still get four free drive bays (two externally accessible), three free 16-bit ISA slots, a free PCI slot, and a slot for a 16-bit ISA or PCI card. The first 16MB of RAM sits in two SIMM slots hidden underneath the drive cages, but fortunately two additional slots are accessible for easy upgrading. The Gateway P5-75 enjoys the same solid service as the P5-100XL and P5-120. As with the other Gateways reviewed this month, the documentation is profuse but not as comprehensive as we've seen with past systems. Still, considering the high performance and full features, this system is an excellent buy for the user who wants a near budget price on a power system.

16 Micron P90 Home MPC

REVIEWED: January 1995

PROS: Great $2499 price for a Pentium-90 PC with a full set of multimedia features

CONS: One-year warranty; 14-inch monitor and 528MB hard drive are small for a power desktop

17 Acma P100

NEW THIS MONTH

PROS: Excellent performance, multimedia configuration

CONS: No weekend technical support, one-year warranty, some cable clutter

When it comes to fast computing, Acma computers tend to run with the quickest. This system is a 100-MHz Pentium, so we expected—and got—sizzling performance. With 16MB of RAM (128MB max) and 256K of secondary cache (512K max), this roomy tower is the second fastest of the dozen Pentium-100s we've reviewed so far, and it ranks in our top half dozen best-performing PCs ever—even including our first Pentium-120s.

The Acma's configuration is solid, including an 853MB Conner hard drive, a 64-bit Diamond Stealth 64 PCI graphics controller with 4MB of VRAM, and a nice 17-inch Mag DX17F monitor. You also get a quad-speed Teac CD-ROM drive, a Sound Blaster 16 Value sound card, and external speakers. (In December's review "CD-ROM Drives: The Power and the Glory," tests done on a quad-speed Teac indicated performance more comparable to a quick double-speed drive's.)

Acma

Accessibility to components inside the Acma's case isn't bad, although the cables from the hard drive and the power source are a bit in the way. Expandability's good: two free SIMM sockets, three free PCI slots, two free 16-bit ISA slots, and six free drive bays.

Acma's standard service offering is just a one-year warranty, though it's backed by on-site service. The 45-day money-back guarantee is a bit longer than usual, but tech support is available weekdays only. Like many other companies, Acma offers optional extensions for the warranty and the on-site service. Even with the standard offerings, the $3699 price is reasonable. Packed with performance and value, this is another very strong Acma value.

18 Compaq Deskpro XL 590 Model 535/MX

NEW THIS MONTH

PROS: Good expandability; legendary support; integrated audio; superior design, fit and finish

CONS: High price, no CD-ROM drive, 540MB entry-level hard drive

Although its $4798 price is high, the Compaq Deskpro XL 590 Model 535/MX is a strong enough contender to secure a foothold on our power chart. With its 16MB of RAM and 256K of secondary cache, this EISA desktop is a solid Pentium-90 performer. And it offers the elegance, efficient design, and superior fit and finish you want in a long-term investment.

Even the ventilation system is optimized in this unit. And Compaq provides a SCSI hard drive—a nice touch if you want to be able to add other SCSI peripherals easily. However, the drive's 540MB size is just entry-level, and there's no CD-ROM drive. The 2MB 32-bit PCI graphics controller is a very solid offering, and the monitor is a generous 17-incher.

Compaq

Compaq's Enhanced Business Audio is a nice touch, letting you add sound clips to applications and use voice commands. You get Sound Blaster–compatible sound and the Vocalyst keyboard with integrated mike and speaker. Drive expandability is quite good, including three free drive bays (two externally accessible). One EISA or PCI slot and three EISA slots are free, and you get integrated SCSI, IDE, and Ethernet adapters. The 16MB of RAM is soldered on, leaving all four SIMM sockets free.

Ask our readers who has the very best service and reliability in the PC world—as we do every month through our Reliability and Service Monitor—and more will pick Compaq than any other company. Support includes a three-year warranty, a 24-hour tech line, and a 30-day money-back guarantee (if you purchase through Compaq Direct). You also get a year of on-site service. The documentation is as good as you can find, and the online help is so good you may never have to crack your copies of the manuals.

Finally, Compaq preinstalls Xerox TabWorks, a Windows shell that uses a notebook metaphor to ease navigation among your applications. Sure, Compaq's Deskpro XL 590 Model 535/MX is pricey, but its design, overall quality, and support are so terrific it still makes our Power Desktops Top 20.

19 DFI Diamond P90

REVIEWED: February 1995

PROS: Fast Pentium-90 performance, multimedia configuration, fax-modem

CONS: No toll-free tech support, some cable clutter inside

20 Tagram Thunderbolt XL

REVIEWED: February 1995

PROS: Ultrafast Pentium-90 performance, three-year warranty, attractive $2672 price

CONS: Interior is somewhat crowded, cable clutter inside case

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THE TOP 20

PC WORLD

BUDGET DESKTOPS

1 **Micron 4100 Magnum**
$1799 buys quick, basic DX4-100.

	Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1 Micron 4100 Magnum	6	9	Aug 94	74	62	65/69	$1799	DX4-100	8	425
2 Micro Express MicroFlex-VL/80	3	4	Mar 95	74	57	[2]	$1449	Am486DX2-80	8	425
3 Polywell Poly 486-80VB	2	5	Feb 95	73	63	[2]	$1639	Am486DX2-80	8	540
4 Dell Dimension XPS P75	1	2	Mar 95	73	62	71/73	$2200	Pentium-75	8	545
5 Diamond DT DX4/100 VIP	5	4	Mar 95	73	60	[2]	$1595	DX4-100	8	540
6 Gateway 2000 P5-60	9	2	Oct 94	73	62	58/61	$1999	Pentium-60	8	730
7 Micro Express MicroFlex-VL/104	4	2	May 95	73	61	[2]	$1699	AmDX4-100	16	540
8 Micron Family MPC LPX	11	7	Dec 94	72	51	65/69	$1799	486DX2-66	16	425
9 Netis N566	28	1	Mar 95	72	72	[2]	$1994	Pentium-66	8	730
10 Polywell Poly 560MPC	7	4	Jan 95	71	65	[2]	$1995	Pentium-60	8	546
11 Polywell Poly 486-100VP4	8	2	May 95	71	63	[2]	$1950	AmDX4-100	16	500
12 Diamond DX4-A100	10	2	May 95	71	56	[2]	$1995	AmDX4-100	16	540
13 Vektron PCI Power Station P-90	—	1	current	71	81	[2]	$2195	Pentium-90	16	853
14 Gateway 2000 P5-60 Family PC	14	3	Dec 94	71	60	58/61	$2099	Pentium-60	8	540
15 Quantex QP5/60 PM-2	12	3	Jan 95	70	61	58/67	$2198	Pentium-60	8	540
16 Blackship Atlantis	15	5	Feb 95	70	45	[2]	$1695	486DX2-66	8	540
17 Micro Express MicroFlex-VL/D6	16	3	Mar 95	70	47	[2]	$1349	486DX2-66	8	270
18 USA Flex DX4-100 Desktop	17	2	May 95	70	67	[2]	$2199	DX4-100	16	730
19 DFI Diamond 66	18	3	Feb 95	70	50	[2]	$1829	486DX2-66	8	540
20 USA Flex PT60 Tower	19	8	Nov 94	70	60	[2]	$1899	Pentium-60	8	425

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2 **Micro Express MicroFlex-VL/80**
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4 **Dell Dimension XPS P75**
$2200 multimedia Pentium-75.

3 **Polywell Poly 486-80VB**
$1639 Am486DX2-80 runs like a Pentium.

5 **Diamond DT DX4/100 VIP**
Quick DX4-100 costs just $1595.

CD-ROM drive	Bus slots	Monitor size/ dot pitch	Vendor contact number	Fax reprint number[1]	Reader service no.	Comments (Recommended as home system)
2X	ISA, VL	14"/.28	800/223-6571	3125	654	$200 price drop brings perennial DX4-100 contender back to the top. Small monitor, hard drive.
—	ISA, PCI	15"/.28	800/989-9900	3208	655	A nice compromise between DX2-66 and DX4-100 at a very tempting price. Small hard drive.
2X	ISA, VL	14"/.28	800/999-1278	3194	656	Inexpensive business starter DX2-80 with small monitor beats some Pentiums and costs less.
2X	ISA, PCI	15"/.28	800/613-3355	3229	657	Budget Pentium from reliable Dell is a staid 75-MHz performer but multimedia ready.
—	ISA, PCI	14"/.28	800/989-7253	3211	658	Great price and good DX4-100 performance but small monitor and no CD-ROM drive.
4X	ISA, PCI	15"/.28	800/846-2000	3232	659	Inexpensive Pentium business system with nice-size hard drive, fast CD-ROM drive.
2X	ISA, VL	15"/.28	800/989-9900	3230	660	Good AmDX4-100 performance, lots of RAM, and a mighty attractive price.
2X	ISA, VL	14"/.28	800/223-6571	3220	661	Good performance for multimedia DX2-66; lots of RAM but small monitor and hard drive.
—	ISA, PCI	15"/.28	800/577-7526	3214	662	Big hard drive and very good performance on this cheap Pentium-66.
2X	ISA, VL	14"/.28	800/999-1278	3219	663	Basic home Pentium system has solid performance, attractive price.
2X	ISA, PCI	14"/.28	800/999-1278	3231	664	Lots of RAM, good price and performance make AmDX4-100 an attractive buy.
2X	ISA, PCI	15"/.28	800/989-7253	3233	665	Similar to Diamond DT DX4/100 VIP but with more RAM—still, it's slower than the Best Buy unit.
—	ISA, PCI	15"/.28	800/725-0026	3251	666	Only Pentium-90 on chart is fastest budget system. Has lots of RAM and big hard drive.
4X	ISA, PCI	15"/.28	800/846-2000	3235	667	Cheap home version of no. 6 business Gateway. Now features a 4X CD-ROM drive.
2X	ISA, PCI	17"/.26	800/896-4898	3217	668	Pentium home system still priced right, especially with 17-inch monitor.
2X	ISA, VL	15"/.28	800/531-7447	3192	669	Decent-value home PC is slowest on budget chart.
—	ISA, PCI	14"/.28	800/989-9900	3236	670	Cheapest system on budget chart, but the hard drive is positively puny.
2X	ISA, VL	15"/.28	800/872-3539	3237	671	DX4-100 with fine performance has lots of RAM, large hard drive.
2X	ISA, PCI	15"/.28	800/808-4334	3238	672	Performance is quite good on this solid DX2-66 unit.
—	ISA, PCI	15"/.28	800/872-3539	3221	673	Price is right on this basic Pentium, but the system is strictly no-frills with small hard drive.

advance (The Top 20 Flash Report, $9.95; available May 23). Touch-tone phone required. [2] Insufficient customer responses to our Reliability and Service Monitor to gauge service performance and reliability. For our overall evaluation, we use an average rating derived from all companies for which we have received fewer than 100 responses.

For more information about all products in this table, circle reader service no. 908.

Top 20 Budget Desktops

If this month's number one system seems familiar, it should: The Micron 4100 Magnum first made its appearance last summer—and then as a *power* desktop PC. Before long, price drops made it a favorite on our budget list, and this DX4-100 has racked up a sterling record of five previous budget Best Buys. After a $200 price drop this month to just $1799, it leapfrogs back up to take another turn at the top. In contrast to the Power Desktops Top 20, with its impressive infusion of new systems, only one PC on our Budget Desktops Top 20 is new this month: the $2195 Vektron PCI Power Station P-90. But this unit is a Pentium-90 with 16MB of RAM and an 850MB hard drive. As you might expect, it's the fastest budget box by far. Meanwhile, Micro Express and Polywell systems with the fast, inexpensive Am486DX2-80 processor from AMD hold steady on the Best Buy list. An array of potent processors shows you can buy power on a budget: One Pentium-75, one Pentium-66, five Pentium-60s, and six DX4-100s (three from AMD) join the Pentium-90. The two Am486DX2-80s and four 486DX2-66s fill out the budget slate.

1 Micron 4100 Magnum

REVIEWED: August 1994

PROS: Good DX4-100 performance, great price

CONS: One-year warranty, 14-inch monitor, small 425MB hard drive

This unit, like most good DX4-100s, performs much like a Pentium-60. It provides a basic 8MB of RAM, a small 14-inch monitor and 425MB hard drive, and just a one-year warranty. But the $1799 price is the crucial factor that makes this PC number one.

2 Micro Express MicroFlex-VL/80

REVIEWED: March 1995

PROS: Fast PC for a great price, good expandability

CONS: Small 425MB hard drive, some cable clutter inside case

This nice AMD Am486DX2-80 minitower with 8MB of RAM, a 425MB hard disk, a respectable 15-inch monitor, a 2MB graphics controller, and good expandability performs almost at the level of a typical Pentium-60—and has a fantastic $1449 price.

3 Polywell Poly 486-80VB

REVIEWED: February 1995

PROS: Power performance for a bargain price, CD-ROM drive

CONS: 14-inch monitor, some cable clutter

This highly expandable $1639 compact's AMD Am486DX2-80 processor delivers solid Pentium-60–level performance in a no-frills package that includes 8MB of RAM, a 540MB hard disk, and a double-speed CD-ROM drive.

4 Dell Dimension XPS P75

REVIEWED: March 1995

PROS: Good basic multimedia configuration, great reliability and service

CONS: One-year warranty on Dimension series PCs, graphics controller has just 1MB of RAM

A number one Best Buy just last month, this $2200 Pentium-75 multimedia minitower's price puts it near our $2250 ceiling for budget desktops. It comes with 8MB of RAM, a solid 545MB hard drive, and a 15-inch monitor. Its performance is just fair for a 75-MHz machine, but its rock-solid reliability and service ratings help this Dimension retain a Best Buy rating.

5 Diamond DT DX4/100 VIP

REVIEWED: March 1995

PROS: Unusually low price for a DX4-100 system

CONS: No toll-free tech support, 14-inch monitor, no CD-ROM drive

This budget-priced DX4-100 configured with 8MB of RAM, a 540MB hard drive, and just a 14-inch monitor performs similarly to a Pentium-60. The great $1595 price helps make up for the lack of a CD-ROM drive and toll-free tech support.

6 Gateway 2000 P5-60

REVIEWED: October 1994

PROS: Good Pentium-60 performance on basic business box with quad-speed CD-ROM drive

CONS: Some less expensive DX4-100 systems offer similar performance

7 Micro Express MicroFlex-VL/104

REVIEWED: May 1995

PROS: Great $1699 price on an AmDX4-100 system that performs much like a Pentium-60

CONS: Some cable clutter inside minitower case

8 Micron Family MPC LPX

REVIEWED: December 1994

PROS: Good 486DX2-66 performance, solid $1799 price for multimedia configuration

CONS: One-year warranty, 14-inch monitor, and small 425MB hard drive

9 Netis N566

REVIEWED: March 1995

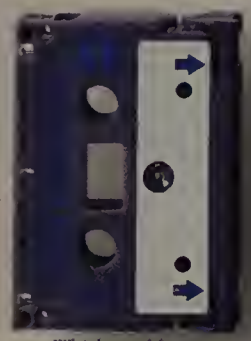
PROS: $1994 price is very good for a fast Pentium-66 with 8MB of RAM and a 730MB hard drive

CONS: One-year warranty is a fairly short standard offering these days, some cable clutter inside

Here's a small piece of big news for everyone who computes away from the office.

Pereos®, the maximum mobile storage device, has arrived.

Now, if that doesn't make your eyes bug out, then you haven't arrived at home, at a hotel, or at 30,000 feet, only to discover the data you need is back at the office.



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DATASONIX

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A Gigabyte of Data in the Palm of Your Hand.

Circle 113 on reader service card

10 Polywell Poly 560MPC

REVIEWED: January 1995

PROS: Low $1995 price for a solid Pentium-60 computer with a voice-enabled fax-modem

CONS: The 14-inch monitor is a small standard offering these days—even with a budget system

11 Polywell Poly 486-100VP4

REVIEWED: May 1995

PROS: Fine AmDX4-100 system performs like many Pentium-60s, multimedia configuration

CONS: The 14-inch monitor is small, and there's a lot of cable clutter inside the case

12 Diamond DX4-A100

REVIEWED: May 1995

PROS: Great price for an AmDX4-100 multimedia PC that performs almost like a Pentium-60

CONS: Sparse documentation, 15-month parts warranty is on the short side

13 Vektron PCI Power Station P-90

NEW THIS MONTH

PROS: Excellent price for good Pentium-90 performance

CONS: One-year warranty, no weekend tech support, piecemeal manuals, no CD-ROM drive

Vektron sent us the only system this month to make it onto our Budget Desktops Top 20, and it accomplishes the feat with ease. The $2195 price—although near our $2250 budget ceiling—is quite low for a system with solid Pentium-90 performance. As you would expect because of its robust processor, the Vektron easily surpasses the performance of every other PC on our budget chart.

This minitower model comes with an impressive configuration for a budget machine: a hefty 16MB of RAM expandable to 128MB, 256K of secondary cache expandable to 1MB, and an 853MB Conner hard drive. The elegant interior shows unusually good fit and finish, even if it is a bit crowded by cables. You get two free SIMM sockets—both of which are easily accessible—so you can expect a trouble-free memory upgrade path. And there's a generous complement of expansion slots (although you'll have to push aside some cables to get to them): two free PCI slots, three free 16-bit ISA slots, and one free slot that can be used for either a PCI or a 16-bit ISA board. In addition, the system provides you with four free drive bays, and three of them are externally accessible.

Vektron

The great price doesn't include a CD-ROM drive, a sound card, or speakers, however. But the graphics subsystem is very solid, with a 64-bit Diamond Stealth 64 PCI controller with 2MB of VRAM that can deliver a maximum resolution of 1280 by 1024 and a very quick 120-Hz noninterlaced vertical refresh rate at 800 by 600. The 15-inch ADI MicroScan 4GP monitor, while certainly adequate for typical business tasks, can't match these capabilities, as it has a maximum noninterlaced vertical refresh rate of 72 Hz at 800 by 600. Don't expect the all-in-one manuals you get from top-tier vendors: Vektron, like many clone manufacturers, provides separate documentation for each component. While experienced PC users may be used to this kind of documentation, it does add to the time spent searching for answers when you have a problem or a question. In addition, the warranty is for just one year, and tech support is available only on weekdays. As with most vendors, optional policies are available extending the warranty and on-site service. In spite of our quibbles, this system is worth a good, long look. Its muscular CPU and high performance are truly outstanding and exceptional for a budget box. Of course, if you want multimedia capabilities, you'll have to add them later on—or fork over the extra cash up front to have them included at initial purchase. Despite its run-of-the-mill service policies, this system is a fine addition to our Budget Desktops Top 20.

14 Gateway 2000 P5-60 Family PC

REVIEWED: December 1994

PROS: Affordable multimedia Pentium-60 with 4X CD-ROM drive, three-year warranty, fax-modem

CONS: Some less expensive DX4-100 systems offer similar performance

15 Quantex QP5/60 PM-2

REVIEWED: January 1995

PROS: Ample configuration with many extras, good Pentium-60 performance

CONS: Ordinary one-year warranty, no weekend technical support

16 Blackship Atlantis

REVIEWED: February 1995

PROS: Low $1695 price for a multimedia 486DX2-66 system with a 14.4-kbps fax-modem

CONS: One-year warranty, no weekend tech support, very crowded interior

17 Micro Express MicroFlex-VL/D6

REVIEWED: March 1995

PROS: 486DX2-66's $1349 price is lowest on chart, 1MB VLB caching hard disk controller

CONS: Small 14-inch monitor, very small 270MB hard drive, some cable clutter inside minitower

18 USA Flex DX4-100 Desktop

REVIEWED: May 1995

PROS: Fast for a multimedia DX4-100, great speakers, fax-modem, three-year warranty

CONS: Plentiful system documentation is generally too technical for typical users

19 DFI Diamond 66

REVIEWED: February 1995

PROS: Solid multimedia configuration, 14.4-kbps modem, good DX2-66 performance

CONS: $1829 price is a little high for a 486DX2-66 with 8MB of RAM and a 540MB hard drive

20 USA Flex PT60 Tower

REVIEWED: November 1994

PROS: Solid Pentium-60 performance, good $1899 price, three-year warranty

CONS: Minor cable clutter inside full tower case, small 425MB hard drive

Network utilities—vital, but set aside 100K

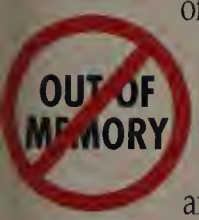
DOS 6 utilities—handy, but about 120K

Multimedia—fun, but can you spare 50-80K?

Internet utilities—where will you get 120K?

If you don't have QEMM 7.5, what else have you sacrificed?

Sooner or later, as you push the limits of your PC's capabilities, you will run into a wall. Memory limits. Drivers that won't load. Crashes. "Out of Memory" messages. And you'll run into this wall whether you have one megabyte in your PC or 16.



That's why millions of people, from PC gurus to novice users run QEMM®. It fixes memory problems and keeps your PC performing at its best.

Introducing QEMM 7.5 It Makes Room for All the Good Stuff

Our newest QEMM takes into account the greater demands you're putting on 'conventional' memory today: device drivers, sound cards, disk compression, caches, network utilities, CD ROM drivers, etc. Not to mention all the stuff you want for tomorrow, like the drivers you'll need for Internet utilities. It finds room for all those things so you don't have to sacrifice capabilities you want—now or in the future.

MemMaker, the memory utility that comes with DOS 6, does an OK job of delivering additional memory, but it just hasn't kept up with demanding users.

Say you wanted to run a mouse, sound card, SmartDrive, your DOS 6 and Novell utilities, and your Microsoft Bookshelf '94 CD ROM. You couldn't with MemMaker. Not unless you were willing to manually 'tune' it. And then you might end up with 490K or so to use. But QEMM 7.5 routinely returns 634K of conventional memory. And when you consider as little as one 'K' of memory makes the difference between a program loading or not, you can see where an additional 140K or so could be vital.

Hot new features

- 100% Windows installable
- Faster 32-bit memory model
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- *Optimize/Restore* lets you revert to recent settings

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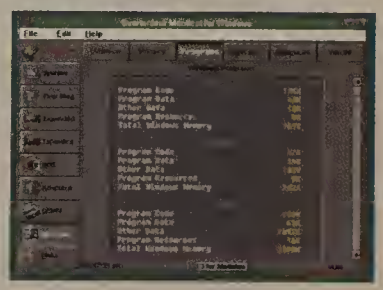

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THE TOP 20

PC WORLD

NOTEBOOK PCs

1 **AST Ascentia 910N**
Class act with super battery, low price.

POWER SYSTEMS

	Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1 AST Ascentia 910N	3	3	Apr 95	94	42	[3]	$4199	DX4-75	8	510
2 Toshiba T4900CT	1	4	Mar 95	93	54	80/73	$7459	Pentium-75	8	810
3 Dell Latitude XP 4100CX	2	3	Apr 95	93	42	[3]	$4199	DX4-100	8	340
4 Compaq LTE Elite	6	9	Oct 94	92	37	83/82	$4799	DX4-75	8	340
5 WinBook XP DX4-100 8/520 Dual-Scan	4	2	May 95	92	48	[3]	$2799	DX4-100	8	520
6 WinBook XP DX4-100 8/520 TFT	–	1	current	91	48	[3]	$3848	DX4-100	8	520
7 IBM ThinkPad 755CE	14	2	Apr 95	91	48	78/77	$6924	DX4-100	8	540
8 Digital HiNote Ultra CT475	–	1	current	91	44	[3]	$5249	DX4-75	8	340
9 NEC Versa P/75HC	–	1	current	91	64	[3]	$5799	Pentium-75	8	540
10 Austin Business Audio 4/100	7	7	Dec 94	91	54	[3]	$3998	DX4-100	16	500

BUDGET SYSTEMS

	Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1 WinBook XP SX-33 Monochrome	1	2	May 95	91	27	[3]	$1859	486SX-33	8	260
2 Compaq Contura 400c	–	1	Feb 95	90	26	83/82	$2368	486DX2-40	8	250
3 WinBook XP DX2/50	2	5	Feb 95	90	28	[3]	$1995	486DX2-50	8	255
4 Dell Latitude 450C	3	3	Jan 95	90	30	[3]	$2668	486DX2-50	8	523
5 Dell Latitude 475C	5	2	May 95	88	41	[3]	$2729	DX4-75	8	330
6 Acom Patriot 4000 DX4-100	6	2	May 95	87	45	[3]	$2725	DX4-100	8	520
7 Austin Business Audio 4/75	7	5	Feb 95	87	36	[3]	$2279	DX4-75	8	250
8 Sceptre SoundX Series 1000	8	2	May 95	86	37	[3]	$1795	486DX2-66	8	340
9 BSI GN8549D	12	5	Jan 95	86	29	[3]	$2080	DX4-100	4	340
10 Acom Patriot 4000 540	9	4	Mar 95	85	35	[3]	$2090	486DX2-66	8	324

BEST BUY

[1] CA = color active, CD = color dual-scan, CP = color passive, MD = mono dual-scan, MP = mono passive. [2] Call 800/434-4495 (for payment by Visa or MasterCard) or 900/993-2972 (for phone billing) and use the fax reprint numbers listed above to order fax copies of system reviews. You can order three systems' capsule reviews ($4.95), a single capsule review plus features table and test report ($4.95), an entire month's review ($9.95), and a list of all systems tested by the PC World Test Center ($4.95).

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2 **Toshiba T4900CT**
Fast, pricey Pentium has it all.

1 **WinBook XP SX-33 Monochrome**
$1859 mono note's battery is tops.

2 **Compaq Contura 400c**
$2368 buys color, top reliability.

Weight (pounds)	Battery life (hours)	Screen type/ size [1]	Vendor contact number	Fax reprint number [2]	Reader service no.	Comments
7	7:55	CA/10.4"	800/876-4278	3683	674	Price drop of over $500, new three-year warranty put classy note with super battery on top.
7.6	3:57	CA/10.4"	800/334-3445	3677	675	Good at everything, huge hard drive, and a strong reliability rating—but very pricey.
7.4	6:46	CA/9.5"	800/613-3355	3685	676	Long life on durable lithium-ion battery, beautifully put together. A very near Best Buy.
7.2	6:32	CA/9.5"	800/345-1518	3650	677	Slowest Top 20 power note, top fit and finish, excellent reliability and support.
7.4	3:32	CD/10.3"	800/468-2162	3690	678	Good performance on inexpensive power unit with big dual-scan screen.
7.6	3:26	CA/9.4"	800/468-2162	3696	679	Fast and relatively cheap. Similar to no. 5 WinBook but with active-matrix screen.
7.4	3:33	CA/10.4"	800/772-2227	3687	—	IBM quality in a classy note with Black Matrix screen that's easily viewable in bright light.
5.8	4:29	CA/9.5"	800/722-9332	3697	680	Ultrathin model has modular floppy drive, durable lithium-ion battery.
8.8	3:26	CA/9.6"	800/632-4636	3698	681	Fast and heavy high-class Pentium note has one of the first 800 by 600 screens available.
8.4	3:08	CA/9.4"	800/331-1501	3661	682	Fast DX4-100 performance and good audio help balance heavy traveling weight.
6.8	8:45	MP/9.5"	800/468-2162	3692	683	Mono unit has longest-lasting battery we've seen, light weight, fax-modem.
7	6:46	CD/9.5"	800/345-1518	3699	684	Excellent battery life and lots of extra features—$500 price drop makes it a budget note.
6.8	6:46	MP/9.5"	800/468-2162	3673	685	Mono unit has low price and excellent battery life and features.
7	3:13	CD/9.5"	800/613-3355	3689	686	Solid color budget notebook with nice-size hard drive.
7.2	3:16	CD/9.5"	800/613-3355	3693	687	Fast budget DX4-75.
8.4	2:47	CD/10.3"	800/898-2665	3694	688	Fastest budget notebook, reasonably priced, but battery life's short.
8.2	3:57	CD/9.5"	800/331-1501	3676	689	Good audio features and a great price.
7.8	2:28	CD/10.3"	800/788-2878	3695	690	Cheapest budget notebook, good audio, poor battery life.
7.6	3:55	CD/9.5"	800/872-4547	3670	691	Amazingly cheap but painfully slow for a DX4-100; add 4MB of RAM for more speed.
8.4	3:30	CP/10.3"	800/898-2665	3682	692	Very good price on passive color DX2-66.

You can also order next month's Top 20 charts and capsule reviews in advance (The Top 20 Flash Report, $9.95; available May 23). Touch-tone phone required. [3] Insufficient customer responses to our Reliability and Service Monitor to gauge service performance and reliability. For our overall evaluation, we use an average rating derived from all companies for which we have received fewer than 100 responses.

For more information about all products in this table, circle reader service no. 909.

Top 20 Notebooks

AST's ASCENTIA 910N—ON OUR POWER CHART since April—is a very fast DX4-75 with a near 8-hour battery life. Now it's number one: An AST price drop of over $500 and AST's new three-year warranty nudge Toshiba's pricey T4900CT Pentium-75 luxury unit down to number two. New entries come from WinBook at number six, Digital at eight, and NEC at nine. NEC's extrafast Pentium-75 features a groundbreaking 800 by 600 screen. WinBook's XP SX-33 Monochrome—the all-time battery king—holds steady at budget number one.

Power Notebooks

1 AST Ascentia 910N

REVIEWED: April 1995

PROS: Super lithium-ion battery, great DX4-75 performance, brilliant screen, three-year warranty

CONS: Some looseness noticeable in review unit's screen hinge

This fast 7-pound DX4-75 has 8MB of RAM, a 510MB hard drive, a 10.4-inch color-active screen, and a lithium-ion battery that lasts nearly 8 hours a charge and takes over three times the recharges of an NiMH battery. The great $4199 price makes this one a steal.

2 Toshiba T4900CT

REVIEWED: March 1995

PROS: Great performance, large brilliant color screen, giant hard disk, three-year warranty

CONS: This computer is one of the highest-priced notebooks available

Hot-performing 7.6-pound Pentium-75 world-class notebook has 8MB of RAM, an 810MB hard drive, a 10.4-inch color-active screen, 65,536 simultaneous colors, a near 4-hour battery life, 24-hour tech support, and a high $7459 price.

3 Dell Latitude XP 4100CX

REVIEWED: April 1995

PROS: Outstanding design, lithium-ion battery with long 6.8-hour life, great three-year warranty

CONS: A number of our readers report long waits on hold after dialing in on sales lines

4 Compaq LTE Elite

REVIEWED: October 1994

PROS: Fine design and screen, 6.5-hour battery life, PC Card hot-swapping, top-rated support

CONS: Performance on this DX4-75 was just so-so when compared with many other notebooks'

5 WinBook XP DX4-100 8/520 Dual-Scan

REVIEWED: May 1995

PROS: Fast DX4-100 with large 10.3-inch color screen, 14.4-kbps fax-modem, 7.4-pound weight

CONS: The one-year warranty is on the short side these days, even for a notebook computer

6 WinBook XP DX4-100 8/520 TFT

NEW THIS MONTH

PROS: Strong DX4-100 performance, good fit and finish, good documentation

CONS: The one-year warranty is on the short side these days, even for a notebook computer

This 7.6-pound DX4-100 comes with 8MB of RAM, a 520MB hard drive, a 14.4-kbps fax-modem, and a crisp, bright 9.4-inch active-matrix color display. The 3.5-hour battery life won't light up your life, but the $3848 price is bound to please.

WinBook DX4-100 TFT

You get a choice of integrated pointing devices: a front-and-center trackball or a minijoystick situated above the B key. The sturdy case is well designed, with a convenient front latch that opens the unit with the push of a button. The PC Card slot accepts either one PC Card Type III or two Type II devices, and you get a PC Card sound card. The documentation is very complete, but the support policies are just basic. Still, what this notebook lacks in flash it more than makes up for with solid, no-nonsense power essentials.

7 IBM ThinkPad 755CE

REVIEWED: April 1995

PROS: Screen has extra viewability in bright light, great keyboard, super reliability and service

CONS: One of the highest-priced notebooks on the market

8 Digital HiNote Ultra CT475

NEW THIS MONTH

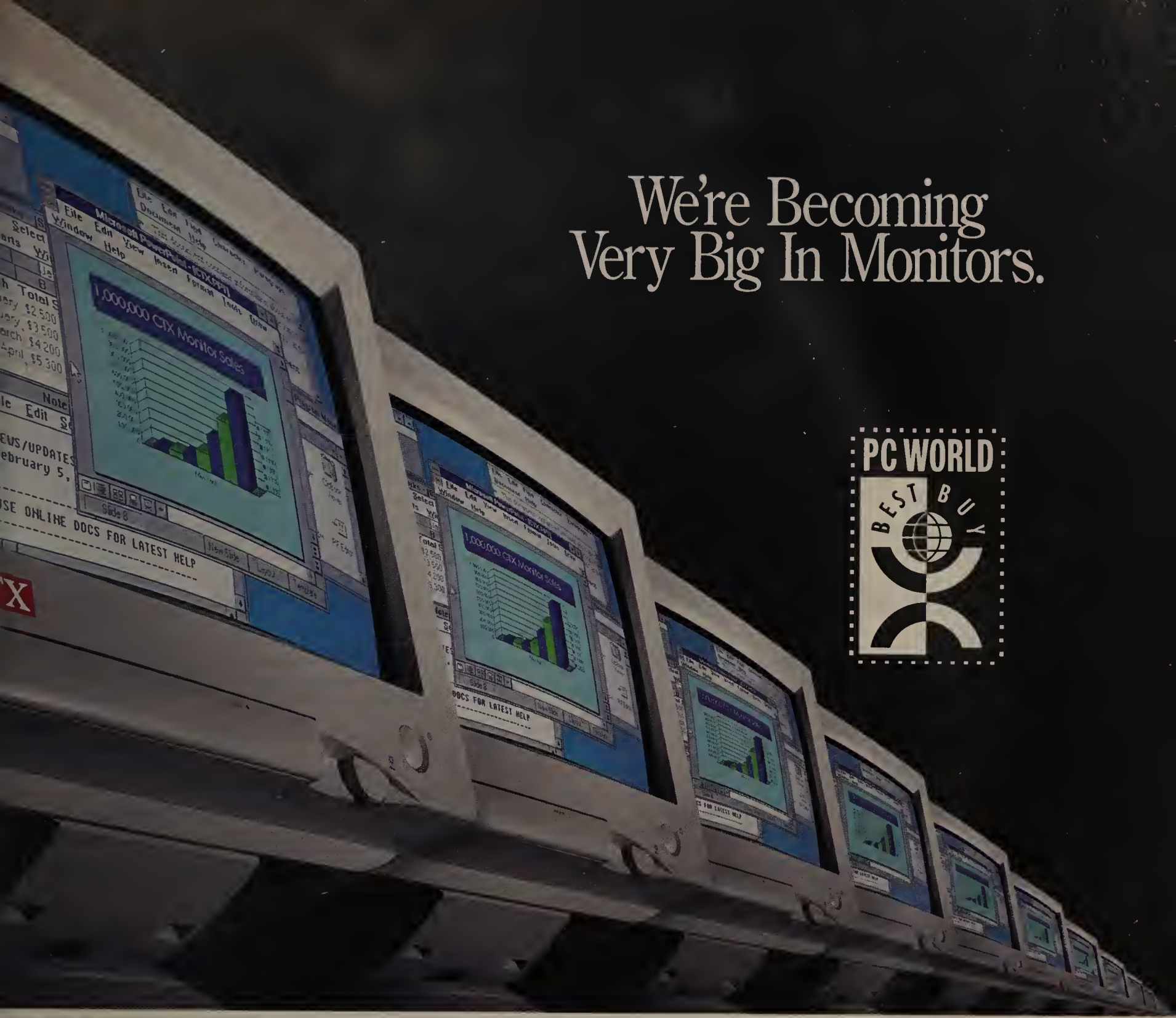
PROS: Fast in Windows, ultralight, integrated sound, lithium-ion battery, three-year warranty

CONS: The $5249 price is high

At just 5.8 pounds and an ultrathin 1.2 inches, this tiny, full-featured DX4-75 is actually a no-nonsense muscle machine, performing in Windows apps like a fast DX4-100. The 8MB of RAM and crisp 9.5-inch active-matrix color display are power staples, though the 340MB hard drive is small. Smart features include a removable floppy drive and a 4.5-hour clip-on lithium-ion battery that swivels down to tilt the notebook toward you or flips up out of the way.

You get a 14.4-kbps fax-modem that uses one of the two PC Card Type II connectors. Other pluses include a 1MB 32-bit graphics controller, 16-bit audio, and an infrared comm port that supports wireless data transfers. The three-year warranty is great. Granted, $5249 is far from cheap, but then again, so is the quality of this classy subnote.

Digital



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That's a million last year alone – more even than sold under big names like NEC, Sony, IBM and Mitsubishi*.

And that's before the international experts started raving about our bigger, new, high-performance 1765GM and 1785GM 17-inch "green" monitors:

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Not only does the larger, flat-square tube give you more display area for Windows,® an ultra-fine .26mm dot pitch and flicker-free 1280 x 1024 at 75Hz resolution bring your graphics to life as never before.

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These new low-radiation (MPR II-compliant) "green" monitors use only five watts of power when "on" but inactive. That's six times better than even the US EPA's own Energy Star guidelines.

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*Official 1993 Monitrak U.S. monitor sales research.

Circle 74 on reader service card

9 NEC Versa P/75HC

NEW THIS MONTH

PROS: Excellent performance, high-resolution 800 by 600 color display, three-year warranty

CONS: Pricey, heavy, no weekend phone support, limited power management settings

NEC's latest has the first 800 by 600 9.6-inch active-matrix color display to hit our chart. This hefty 8.8-pound Pentium-75 is one of the fastest notebooks yet, and the 3.5-hour battery is decent—considering. The Versa's keys have full travel and quiet action. You get 8MB of RAM, a 540MB hard drive, built-in 16-bit sound, speakers, and a mike. The three-year warranty is great, but there's no weekend tech support. At $5799, the Versa P/75HC isn't cheap—but no notebook with this class of power features is.

NEC

10 Austin Business Audio 4/100

REVIEWED: December 1994

PROS: Very fast DX4-100 performance, 1MB local bus graphics controller, integrated audio

CONS: Screen colors seem somewhat muted on active-matrix color screen, heavy

Budget Notebooks

1 WinBook XP SX-33 Monochrome

REVIEWED: May 1995

PROS: Attractive price, 8.8-hour battery life, light 6.8-pound weight, 14.4-kbps fax-modem

CONS: Short one-year warranty, small 260MB hard drive

The best battery life we've seen, at 8.8 hours. Basic monochrome note's pluses outweigh the small hard drive and short warranty.

2 Compaq Contura 400c

REVIEWED: February 1995

PROS: Long 6.8-hour battery life, great service and support, light 7-pound traveling weight

CONS: On/off switch above <Esc> key is too easy to hit by mistake, small 250MB hard drive

This 7-pound 486DX2-40 with 8MB of RAM just dropped $500. You get a 6.8-hour battery and a 9.5-inch dual-scan color screen.

3 WinBook XP DX2/50

REVIEWED: February 1995

PROS: Long 6.8-hour battery life, light 6.8-pound weight, low price, 14.4-kbps fax-modem

CONS: Can't hot-swap battery, one-year warranty is short even for a notebook these days

4 Dell Latitude 450C

REVIEWED: January 1995

PROS: Fast for a DX2-50, 7-pound weight, 523MB hard drive, fax-modem

CONS: One-year warranty is minimal coverage on today's systems

5 Dell Latitude 475C

REVIEWED: May 1995

PROS: Solid DX4-75 performance, removable floppy drive, 24-hour tech support

CONS: One-year warranty is minimal coverage on today's systems

6 Acom Patriot 4000 DX4-100

REVIEWED: May 1995

PROS: Fine performance, large dual-scan color screen, 14.4-kbps fax-modem, fair price

CONS: Short 2.8-hour battery life, hefty 8.4-pound traveling weight, short one-year warranty

7 Austin Business Audio 4/75

REVIEWED: February 1995

PROS: Great price, decent DX4-75 performance, audio, 24-hour tech support

CONS: One-year warranty, 8.2-pound traveling weight, limited power management

8 Sceptre SoundX Series 1000

REVIEWED: May 1995

PROS: Fast for a 486DX2-66 notebook, low price, large dual-scan color screen, integrated audio

CONS: Short battery life, poor display quality, brief one-year warranty, short tech support hours

9 BSI GN8549D

REVIEWED: January 1995

PROS: Light 7.6-pound weight, good near 4-hour battery life, integrated audio, low price

CONS: Minimal 4MB of RAM, slow for a DX4-100, one-year warranty, no weekend tech support

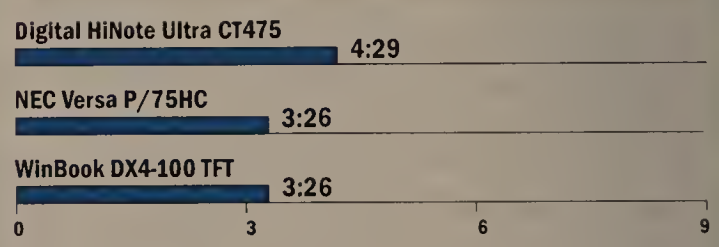
10 Acom Patriot 4000 540

REVIEWED: March 1995

PROS: Great 486DX2-66 performance, low price, audio, 10.3-inch passive color screen

CONS: Dull screen colors, 8.4-pound traveling weight, no set turnaround policy on repairs

TEST REPORT Battery Life



Time in hours:minutes.

Methodology
We drain and fully recharge the battery and set power-saving options to match a consistent profile where possible. Office workers type at regular intervals in Word for Windows, saving periodically. Notebooks are rotated among workers to even the workloads. We report the time elapsed until the notebook shuts itself off.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

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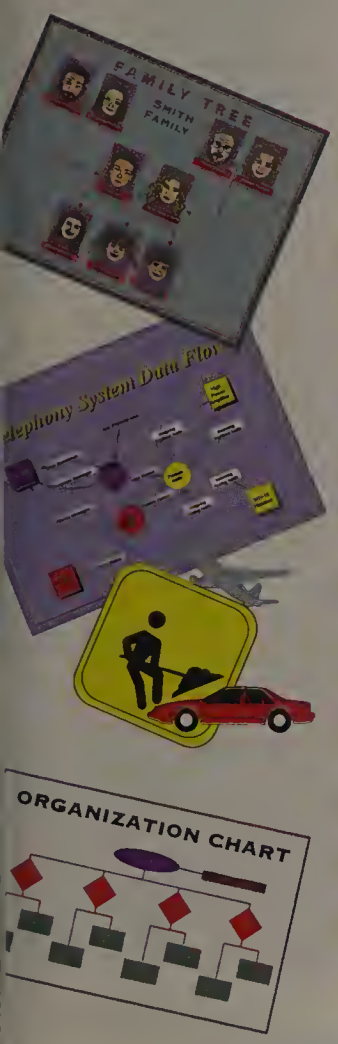

Compare the Features

VALUE	CorelFLOW	VISIO 3.0	ABC Flowcharter 3.0
List price (U.S. dollars)	$99	$199	$495
Number of pre-defined symbols	2,000	750	400
Number of clipart images	1,000	0	0
Number of photos on CD-ROM	1,000	0	0
Number of fonts	100	0	24
Number of colors	256	24	16.8 million
Number of pre-defined arrow types	39	11	15
Number of import/export filters	8/7	9/9	1/1
Number of symbol libraries	91	22	25
EASE OF USE			
"Drag and drop" symbols	●	●	●
Symbol auto-connect	●		●
Auto-resize symbols to fit text	●		
On-screen text and line editing	●	●	●
On-line interactive tutorial	●		
Spellchecker	●		
Symbol substitution	●	●	●
DIAGRAMMING FEATURES			
OLE 2.0 server	●	●	●
Create customized symbols	●	●	●
Draw symbols	●	●	
Save customized symbols to library	●	●	●
Open multiple symbol libraries	●	●	
Diagram linking	●	●	●
Create custom line arrows	●		
Works in layers	●	●	
Rotate objects	●	●	
Mirror objects	●	●	

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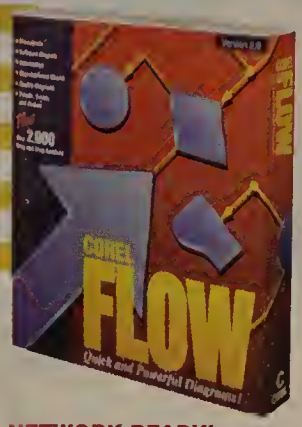

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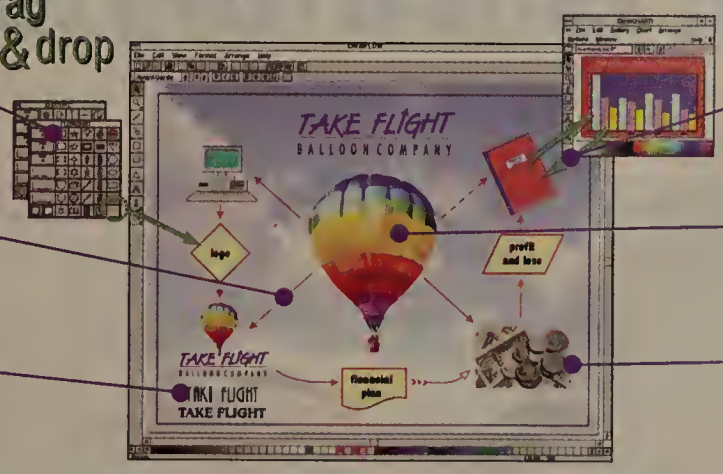

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PC Magazine, November 1994

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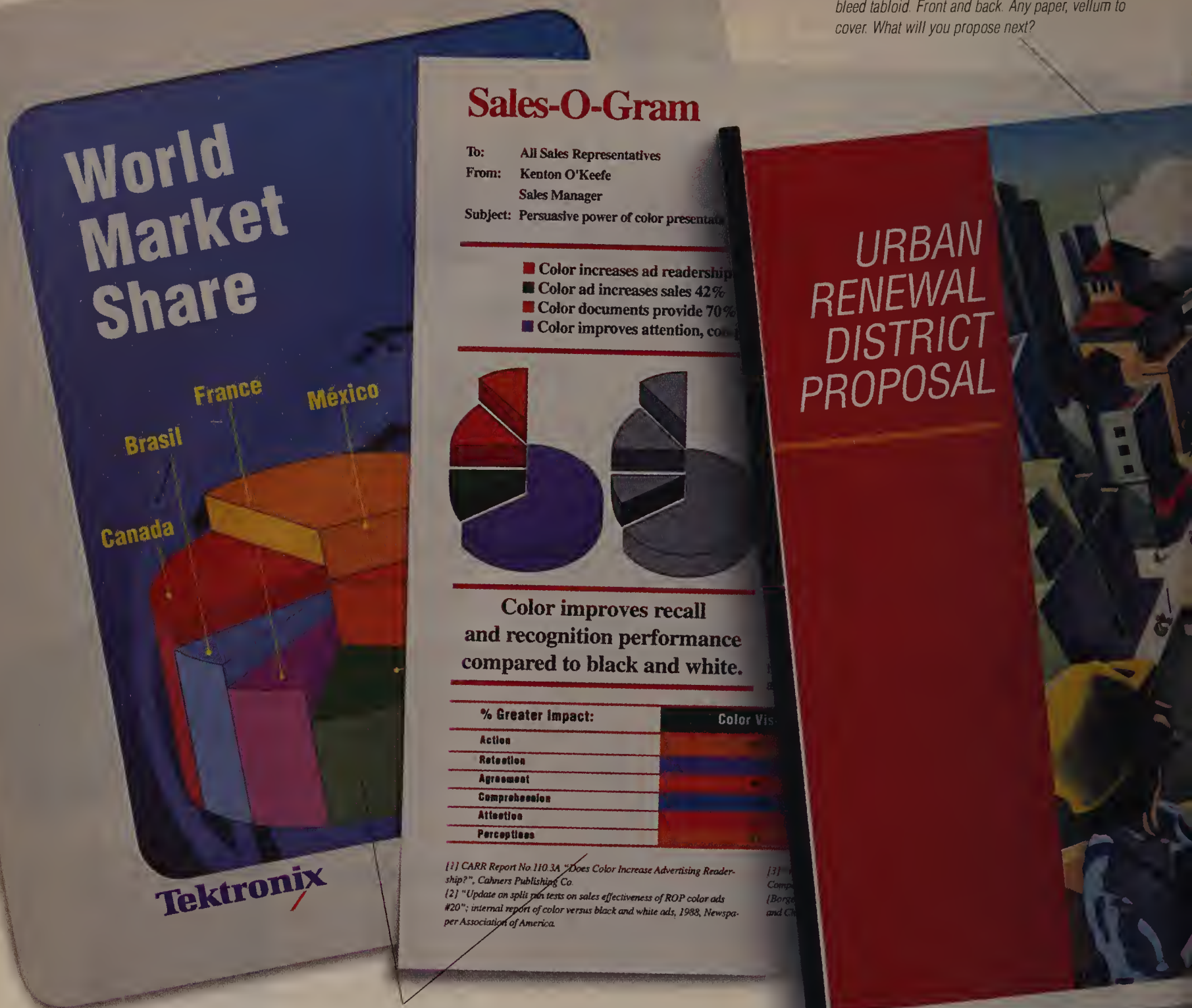

High impact, business-building overheads. Info-rich report graphics on plain or glossy paper. Up to 600 x 300 dpi. Up to 4 pages per minute! Desktop option switches paper and transparencies. Get your share of the pie quickly and easily!

Color is color, until you

These are the color printers of Tektronix, the best in the world. For all the colorful things you do in business, graphic arts, science and engineering, there's a Phaser Color Printer that fits your requirements perfectly.

Among these award-winning printers are the Phasers designated Editors' Choice by *PC Magazine*. "All five offerings from the [Tektronix] Phaser line define the state of the art in their respective categories.*" Now four new Phasers raise those standards even higher.

Phaser Color Printers for the Business Office

Paper size	Letter A/A4	Letter A/A4	Letter A/A4
Media type	Plain paper Glossy paper and transparency	Laser paper Special paper and transparency	Plain office text and cover papers, and transparency
Print time	1-2 minutes/page	2 pages/minute	4 pages/minute
Resolution	360 dpi	600 x 300 dpi or 300 dpi	600 x 300 dpi or 300 dpi
Cost Per Page	Low - Mid	Mid	Low
	NEW Phaser 140	**Phaser 220**	**NEW Phaser 340**

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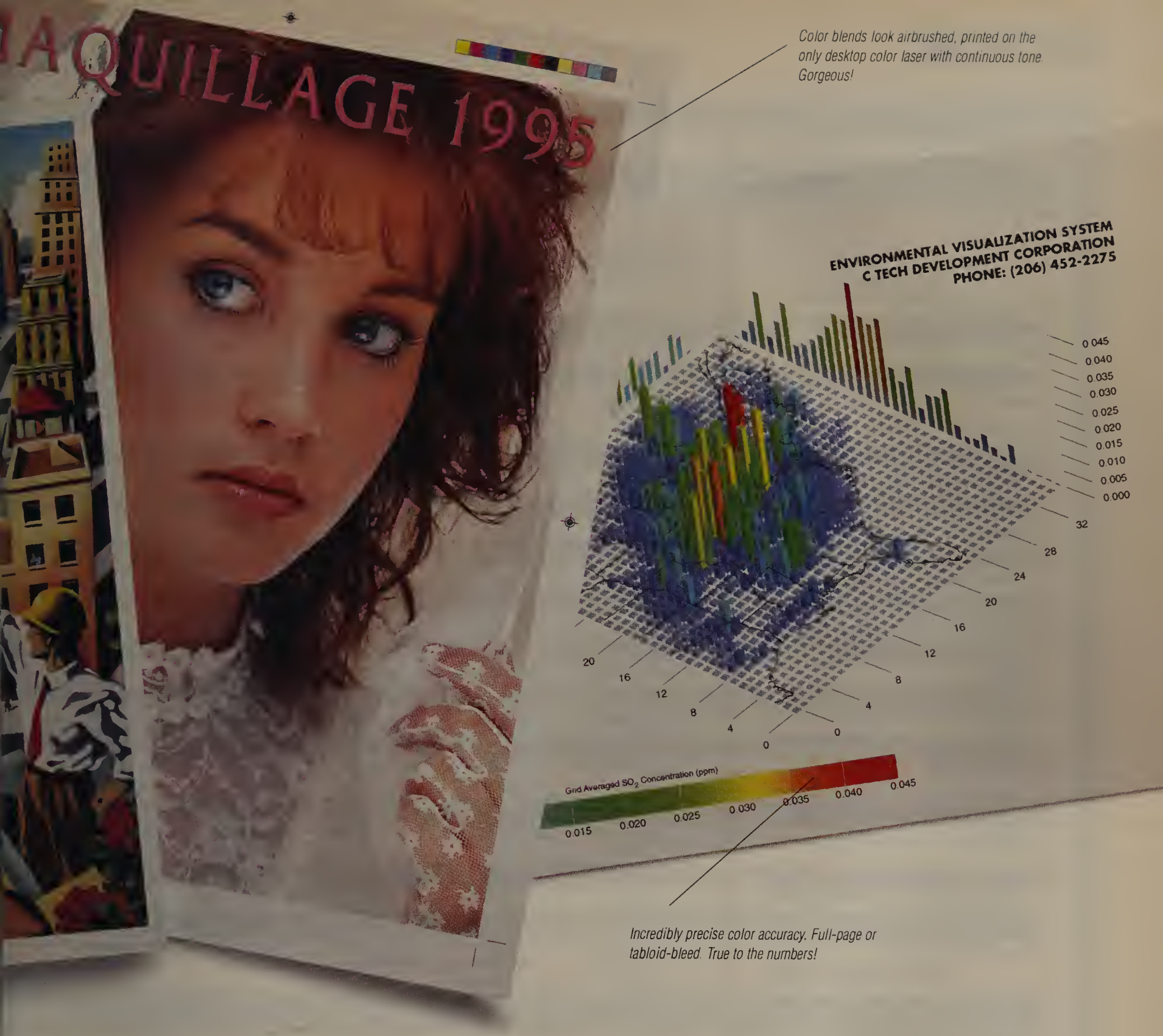
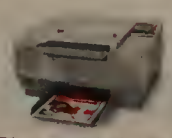


Color blends look airbrushed, printed on the only desktop color laser with continuous tone. Gorgeous!

Incredibly precise color accuracy. Full-page or tabloid-bleed. True to the numbers!

see the best side by side.

	Phaser Color Printers for the Professions		
Letter A/A4	*Flexible 4 x 6 ins. to 12 x 18 ins.*	*Letter A/A4 Letter extra*	*Tabloid/B Tabloid extra*
Laser paper and transparency	*Any paper and transparency*	*Special paper and transparency*	*Special paper and transparency*
3.5 pages/minute	*1-2 minutes/page*	*2 minutes/page*	*3 minutes/tab page*
600 dpi Continuous tone	*300 dpi*	*300 dpi Continuous tone*	*300 dpi Continuous tone*
Low	*Low - Mid*	*Premium*	*Premium*
			
NEW Phaser 540	**Phaser 300i / III**	**NEW Phaser 440**	**Phaser 480**

All Phaser Color Printers offer:

■ 300 dpi or 600 dpi ■ AdobePostScript™ Level 2 ■ Paper prints or transparencies ■ Support for PCs, Macs, workstations and networks ■ Pantone's color certification ■ RISC-speed print processing ■ TekColor™ image enhancement ■ A Tektronix one year warranty ■ Top technical support.

Tektronix

Free output sample and nearest dealer, call 800/835-6100, Ext. 1075.

Circle 124 on reader service card

FEATURES COMPARISON This Month's Contenders—Desktops

● = Yes ○ = No

n/a = not applicable

Standard features	Acma P100	Compaq Deskpro XL 590 Model 535/MX	Dell Dimension XPS P120c	Gateway 2000 P5-75	Gateway 2000 P5-100XL
Street price as of 2/28/95 [1]	$3699	$4798	$4689	$2499	$3799
CPU	Pentium-100	Pentium-90	Pentium-120	Pentium-75	Pentium-100
CPU or upgrade socket	320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF
BIOS	AMI 34617	Compaq 11/22/94	AMI 0.05.01.DX0J, Beta 1.05, 2/07/95	AMI 1.00.12.AX1T, 1/27/95	AMI 1/12/95, v0.10.01.BR0 Beta 1.10
Installed/maximum RAM (MB)	16/128	16/144	16/128	16/128	16/128
30-pin or 72-pin SIMMs	72-pin	72-pin	72-pin	72-pin	72-pin
SIMM sockets/number free	4/2	4/4	4/0	4/2	4/0
Secondary RAM cache installed/maximum (K)	256/512	256/256	256/256	256/256	256/256
Case style	tower	desktop	minitower	compact	tower
Free externally accessible 3½-inch/5¼-inch drive bays	1/4	0/2	1/1	0/2	0/3
Free internal 3½-inch/5¼-inch drive bays	0/1	1/0	1/0	2/0	3/0
Free 32-bit EISA/16-bit ISA/8-bit ISA expansion slots	0/2/0	4/0/0	0/3/0	0/4/0	0/1/0
PCI or VL bus slots/number free	4 PCI/3	2 PCI/1 [2]	4 PCI/3 [3]	3 PCI/2 [3]	4 PCI/3 [3]
Hard disk	Conner CFA850A	Conner CP30540	WD Caviar 31600	WD AC2700H	WD Caviar 31000
Size (MB)	853	540	1624	730	1083
Adapter	integrated	integrated	integrated	integrated	integrated
Floppy drives (MB)	1.44	1.44	combo	1.44	1.44
Graphics adapter	Diamond Stealth 64	Compaq QVision 2000	Number Nine Imagine 128	ATI GX Mach 64	ATI GX Mach 64
Installed VRAM/DRAM (MB)	4/0	2/0	4/0	2/0	2/0
Monitor	Mag DX17F	Compaq 171FS	Dell UltraScan 17ES	Gateway 2000 Vivitron 1572	Gateway 2000 Vivitron 1572
Tube/viewable screen diagonal (inches)	17/16.1	17/16	17/14.8	15/14	15/14
Dot pitch (mm)	.28	.28	.26	.26	.26
Modem speed for fax/data (kbps)	n/a	n/a	n/a	n/a	14.4/14.4
Sound board	Creative Labs Sound Blaster 16 Value	Compaq Enhanced Business Audio	Creative Labs Sound Blaster 16	Ensoniq Soundscape	Gateway 2000 Ensoniq
CD-ROM drive	Teac CD55-A	○	NEC CDR-271	Mitsumi CRMC- FX400	Mitsumi CRMC- FX400
Data transfer rate (K/sec)	600	n/a	600	600	600
Parallel/serial/mouse/SCSI ports	1/2/0/0	1/2/2/1	1/2/1/0	1/2/1/0	1/2/1/0
Service and support					
Warranty (years)	1	3	1	3	3
30-day money-back guarantee	● [4]	● [5]	●	●	●
On-site service first-year price	free	free	free	free	free
Repair turnaround policy (days)	3	2	7	○	○
Daily toll-free phone support (hours)	9.5	24	24	18	18
Weekend support	○	●	●	● [6]	● [6]
BBS	●	●	●	●	●
Fax	●	●	●	●	●

BEST BUY

[1] All systems priced as configured with DOS 6.0 or later version, Windows 3.1, VGA and color monitor, keyboard, and mouse or other pointing device. Price is direct or based on vendor estimate.

[2] One less EISA slot available when all PCI slots are filled, and vice versa.

[3] One less 16-bit slot available when all PCI slots are filled, and vice versa.

Gateway 2000 P5-120	HP Vectra VL3 5/120	Micron P120 Millennia	NEC PowerMate VP75	Vektron PCI Power Station P-90
$4299	$3700	$3799	$2924	$2195
Pentium-120	Pentium-120	Pentium-120	Pentium-75	Pentium-90
320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF
AMI 1.00.01.BR0T, 2/10/95	HP GK.05.03	Phoenix 4.04, M54Hi-P17, 2/24/95	Phoenix v4.04.5, 1/31/95	Award v4.50G, 10/18/94
16/128	16/192	16/128	16/128	16/128
72-pin	72-pin	72-pin	72-pin	72-pin
4/2	6/4	4/2	4/2	4/2
256/256	256/256	256/256	256/256	256/1024
tower	compact	minitower	minitower	minitower
0/3	0/0	0/2	0/2	1/2
2/0	2/0	2/0	1/0	1/0
0/2/0	0/3/0	0/3/0	0/3/0	0/4/0
4 PCI/3 [3]	2 PCI/2 [3]	4 PCI/3 [3]	2 PCI/2 [3]	4 PCI/3 [3]
WD Caviar 31600	WD Caviar 2850	Conner CFA1275A	Conner CFA1275A	Conner CFA850A
1624	853	1278	1278	853
integrated	integrated	integrated	integrated	integrated
1.44	1.44	1.44	1.44	1.44
ATI GX Mach 64	integrated	Diamond Stealth 64	Cirrus Logic CL-GD5434	Diamond Stealth 64
2/0	0/2	2/0	0/1	2/0
Gateway 2000 Vivitron 1776	Hewlett-Packard D2807A	ADI MicroScan 4V	NEC MultiSync XV15	ADI MicroScan 4GP
17/16	15/14	15/13.8	15/13.8	15/13.8
.26	.28	.28	.28	.28
14.4/28.8	n/a	n/a	n/a	n/a
Ensoniq Soundscape Wavetable Sound Card	○	OEM	Creative Labs Sound Blaster Vibra 16	○
Gateway 2000 IDE CD-ROM Quad Speed	Sony CDU 55D	Sony CDU-76E	Mitsumi CRMC- FX400	○
600	300	600	600	n/a
1/2/0/0	1/2/1/0	1/2/1/0	1/2/1/0	1/2/0/0
3	3	1	3	1
●	○	●	○	●
free	free	free	○	$50
○	3	2	1	3
18	24	13	11.5	8
● [6]	●	● [6]	○	○
●	●	●	●	●
●	●	●	●	●

[4] 45-day money-back guarantee.

[5] When purchased through Compaq Direct.

[6] Saturdays only.

System Snapshots

These desktops and notebooks were tested and reviewed along with the others, but didn't score high enough to reach the Top 20 charts.

AST Bravo MS-T 4/66d

PROS: Fine service, support, and reliability; good fit and finish

CONS: This unit is rather pricey for a 486DX2-66 with no CD-ROM drive and an unusually small hard drive

Basic 486DX2-66 midsize tower, 8MB of RAM, very small 270MB hard drive, great three-year warranty, 24-hour-a-day tech support. $2000. *AST Computer, 800/876-4278, 714/727-4141* **Reader service no. 772**

AST Premmia GX P/90

PROS: Solid Pentium-90 performance; big hard drive; very good fit and finish; excellent service, support, and reliability

CONS: The price on this unit is particularly high even for a well-configured power Pentium-90 desktop machine

Solid Pentium-90 multimedia setup: 16MB of RAM, 1083MB hard drive, CD-ROM drive, 16-bit sound card, speakers, 2MB PCI graphics controller, plus strong three-year warranty, 24-hour tech support, and good fax-back feedback from readers. $6380. *AST Computer, 800/876-4278, 714/727-4141* **Reader service no. 773**

AT&T Globalyst 360TPC

PROS: Bundled CD-ROM software, excellent service package

CONS: Limited expandability for a minitower, 14-inch monitor and 420MB hard drive are both small for today's demands

Communications special in a 486DX2-66 minitower with 8MB of RAM, 420MB hard drive, CD-ROM drive, sound card, 14.4-kbps fax-modem, speakers, CD-ROM software collection. $2199. *AT&T Global Information Solutions, 800/447-1124, 513/445-5000* **Reader service no. 774**

Blackship Atlantis 66

PROS: Good price for a system with a CD-ROM drive, a sound card, speakers, and a 14.4-kbps fax-modem

CONS: Slow even for a 486DX2-66, lots of cable clutter inside

Slow 486DX2-66 desktop system, 8MB of RAM, 540MB hard drive, 14.4-kbps fax-modem, quad-speed Teac CD-ROM drive (recent tests with a Teac quad-speed drive resulted in performance more like a fast

How Apple is making it easier to move a refrigerator like this.

Today's sales environment is more competitive than ever. Which is why Whirlpool armed its field force with the ultimate sales weapon: the Macintosh® PowerBook® computer.

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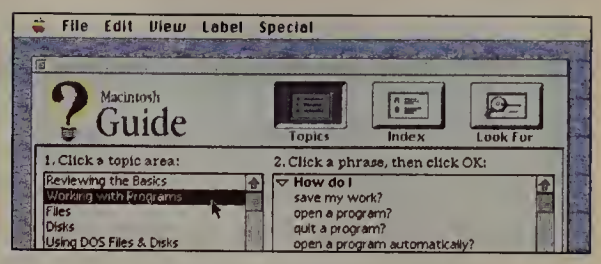
"Making the sale means having the answer. With this computer, we can get the information our customers need, right on the spot. Making the sale means being persuasive. By delivering presentations on the PowerBook, we can get our point across with enormous impact. Combine this with the fact that it works with our mainframes, Intel-based PCs and Windows, and we're talking about a tool that's not just giving us a competitive edge. It's transforming the way we do business."

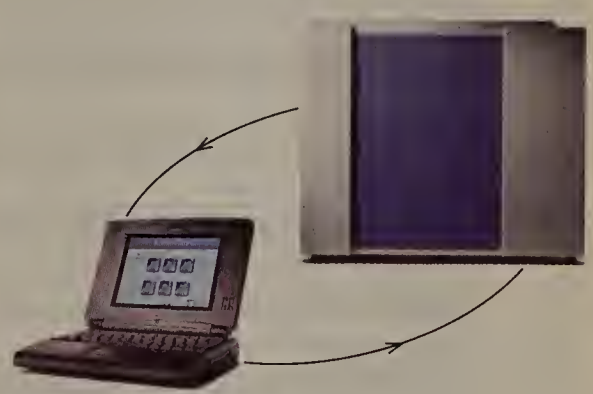
–Ed Herrelko

Erv Barnes (left), Director of Information Technology, and Ed Herrelko (right), Executive Vice President of Group Sales, at Whirlpool Corporation, Benton Harbor, Michigan

This is Whirlpool's interactive on-screen sales presentation. With it, salespeople can show video clips of Whirlpool commercials and product demonstrations—a more dramatic and impactful way to sell competitive product advantages.



Your salespeople want to sell, without being confused by complex technology. With features like Apple® guide—which takes users step-by-step through the Macintosh—Whirlpool's people mastered the computer with minimal training. Yours can too.



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*Whirlpool uses RemoteWare from Xcellenet, Inc. for access to the IBM mainframe. Passport for Macintosh from Advantis for IBM 3270 terminal emulation and cc:Mail Mobile from Lotus Development Corporation to exchange e-mail between Macintosh and Windows environments.

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Circle 52 on reader service card

double-speed drive's), sound card, speakers, nice CD-ROM bundle. This unit is very similar to the Blackship Atlantis system that's currently on our Budget Desktops Top 20, but it's noticeably slower. $1795. *Blackship Computer Systems, 800/531-7447, 408/432-7500* **Reader service no. 775**

Blackship P-90 Neptune

PROS: Inexpensive for a Pentium-90 with a multimedia configuration and a 14.4-kbps fax-modem

CONS: System is surprisingly slow for a Pentium-90 computer (even one with 8MB of RAM), some cable clutter inside

Surprisingly slow Pentium-90 desktop system, only 8MB of RAM, 540MB hard drive, 14.4-kbps fax-modem, quadruple-speed Teac CD-ROM drive with just so-so performance, sound card, speakers, nice selection of bundled software on CD-ROM. $2495. *Blackship Computer Systems, 800/531-7447, 408/432-7500* **Reader service no. 776**

FEATURES COMPARISON This Month's Contenders—Notebooks

● = Yes ○ = No

n/a = not applicable

Standard features	Digital HiNote Ultra CT475	NEC Versa P/75HC	WinBook XP DX4-100 8/520 TFT
Street price as of 2/28/95 [1]	$5249	$5799	$3848
CPU	DX4-75	Pentium-75	DX4-100
Traveling weight (pounds) [2]	5.8	8.8	7.6
Width x depth x height (inches)	11 x 8.5 x 1.2	11.8 x 9.4 x 2.2	11.5 x 9 x 2
Installed/maximum RAM (MB)	8/24	8/40	8/32
Secondary RAM cache installed/maximum (K)	0/0	256/256	0/0
Installed/maximum hard disk (MB)	340/340	540/810	520/810
Removable hard disk	○	●	●
Display type	color active	color active	color active
Screen diagonal (inches)	9.5	9.6	9.4
Maximum colors or gray shades of LCD	256	256	256
Simultaneous LCD and external monitor	●	●	●
Highest resolution of external monitor	1024 x 768	1024 x 768	1024 x 768
Mouse/keyboard ports	1/0 [3]	1/0 [3]	1/0 [3]
Cursor keys in inverted T	●	●	●
Dedicated page-control keys	●	●	●
All 12 function keys dedicated	●	●	●
Standard <Ctrl> and <Alt> layout	●	○	○
Built-in pointing device	●	●	●
Modem speed for fax/data (kilobits per second)	14.4/14.4	n/a	14.4/14.4
Docking station available	●	●	●
PC Card (PCMCIA) slot Type II/III	0/1 [4]	0/1 [4]	0/1 [4]
Power management			
Supports APM	●	●	●
Type of battery	lithium ion	NiMH	NiMH
Suspend button	●	●	●
Suspends when case closed	●	○	○
Service and support			
Warranty (years)	3	3	1
30-day money-back guarantee	●	●	●
On-site/replacement service first-year price	free	○	○
Repair turnaround policy (days)	2	5	3
Daily toll-free phone support (hours)	24	11.5	11
Weekend support	●	○	● [5]
BBS	●	●	●
Fax	●	●	●

[1] All notebooks priced as configured with DOS 6.0 or later version, Windows 3.1, VGA monochrome or better display, and mouse or other pointing device. Price is direct or based on vendor estimate.

[2] Includes computer, adapter, power cord, and external floppy drive if notebook has one.

[3] Mouse port doubles as keyboard port.

[4] Type III slot alternatively holds two Type II devices.

[5] Saturdays only.

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- Ambra, #804
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- Ares, #806
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- AT&T, #808
- Austin, #809
- Blackship, #810
- Compaq, #811
- CompuAdd, #812
- CompuDyne, #813
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- DEC, #816
- Dell, #817
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- Pionex, #831
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- Swan, #833
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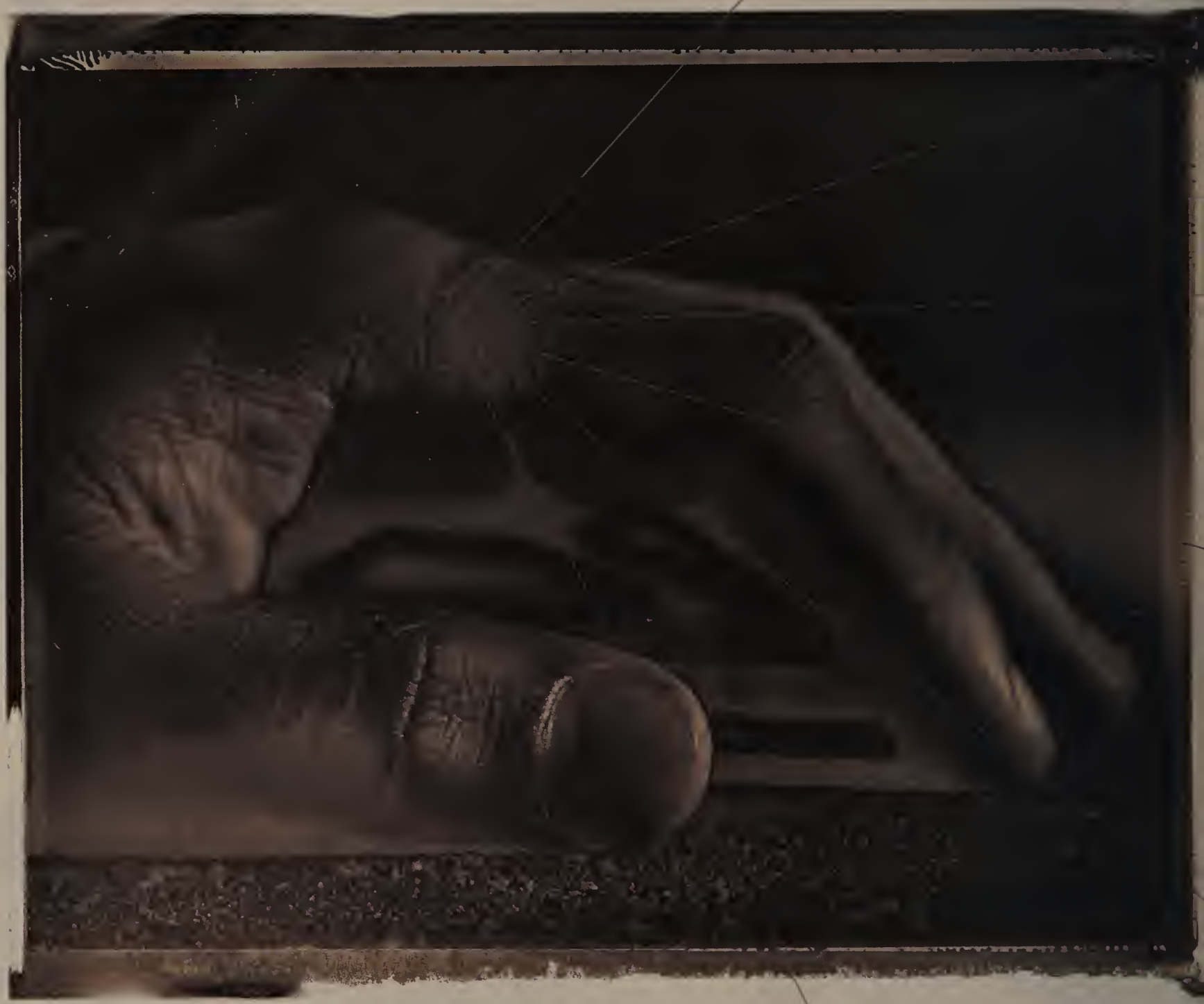
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until infused with
ideas,
thoughts,
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that come to it
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BSI NP9546T CD-Sound Notebook

PROS: 16MB RAM, built-in 2X CD-ROM drive, integrated sound
CONS: Short 2.3-hour battery life, poor support policies, heavy

DX2-66 note, 16MB of RAM, CPU upgradable to DX4-100, hefty 11.2-pound weight, 503MB hard drive, 9.6-inch active-color screen. $3440. *Broadax Systems, 800/872-4547, 818/442-0020* **Reader service no. 777**

Caliber Voyager 1

PROS: Very good expandability, 4X Toshiba SCSI CD-ROM drive
CONS: No weekend technical support or toll-free tech line

Pentium-100 multimedia tower, 1083MB hard drive—just 8MB RAM. $3599. *Caliber Computer, 510/353-1220* **Reader service no. 778**

CompuAdd CP90p Mini-Tower

PROS: Fast, quad-speed CD-ROM drive, 24-hour tech support
CONS: One-year warranty, some cable clutter inside case

Highly expandable Pentium-90 minitower, 16MB of RAM, 540MB hard drive, sound card, speakers. $3094. *CompuAdd, 800/627-1961, 512/250-2930* **Reader service no. 779**

DataStor Nx5-100

PROS: Multimedia configuration, three-year warranty
CONS: Scarce space for add-in cards, no weekend tech support

NexGen Nx586-P100 multimedia compact runs like a typical Pentium-100. 16MB of RAM, 540MB hard drive, 15-inch monitor, 2MB VLB graphics card, three-year warranty. $3393. *Data Storage, 800/543-6090, 303/442-4747* **Reader service no. 780**

Diamond DT P5-100 MPC Pro

PROS: Good Pentium-100 performance, 1083MB hard drive
CONS: 14-inch monitor, no weekend technical support

Multimedia PC, 16MB RAM, 1083MB hard drive. $3495. *Diamond Technologies, 800/989-7253, 714/533-9910* **Reader service no. 781**

DTK Quin-52M

PROS: 24-hour technical support, very good expandability
CONS: Pricey for a Pentium-90 without multimedia extras

Slightly slow Pentium-90 tower with 16MB of RAM, 540MB hard drive, 15-inch monitor, 2MB PCI graphics accelerator. $3250. *DTK Computer, 800/289-2385, 818/810-0098* **Reader service no. 782**

FutureTech FutureMate 3000

PROS: Fast, one-day service turnaround, very good manuals
CONS: 2-hour battery, no weekend tech support, heavy

Pentium-90 note, 8MB of RAM, 540MB hard drive, 10.4-inch active-color screen, infrared comm port. $4864. *FutureTech, 800/275-4414, 201/488-4414* **Reader service no. 783**

HP OmniBook 4000CT

PROS: Well made, three-year warranty, 24-hour tech support
CONS: Unit is very heavy, with 8.6-pound traveling weight

DX4-100 notebook has 8MB of RAM, a 520MB hard drive, an infrared comm port, integrated sound, mike, and speakers, 10.4-inch active-matrix screen. This is a very classy note, and it just barely misses our Top 20 chart. $4099. *Hewlett-Packard Co., 800/752-0900, 503/715-2000* **Reader service no. 784**

THE HP OMNIBOOK 4000CT IS HEAVY BUT QUITE WELL MADE. THIS IS A VERY CLASSY NOTEBOOK, AND IT JUST BARELY MISSES OUR TOP 20.

IBM PC 750-P90

PROS: Great fit and finish, 17-inch monitor, three-year warranty
CONS: Sound's not Sound Blaster compatible, high price

Classy Pentium-90 desktop, 16MB of RAM, 540MB hard drive, 2X CD-ROM drive, integrated 64-bit sound, 14.4-kbps fax-modem, great 24-hour tech support. Pricey, but with IBM's usual high quality—almost made our power chart. $5000. *IBM, 800/772-2227*

Insight Hemisphere PCI P100 MM

PROS: Fast, high-quality components, 24-hour tech support
CONS: One-year warranty, no on-site service

Fast and highly expandable Pentium-100 tower, 16MB of RAM, 1083MB hard drive, 17-inch monitor, 2MB 64-bit PCI graphics controller, high-quality Plextor quad-speed SCSI CD-ROM drive, nice sound and speakers, fast 14.4/28.8-kbps fax-modem. $4300. *Insight, 800/998-8011, 602/902-1176* **Reader service no. 785**

Micro Express MicroFlex Pentium 75

PROS: Very reasonable price for a Pentium-75
CONS: No CD-ROM drive or sound; small 14-inch monitor

Spare configuration on this midsize Pentium-75 tower. System is a very solid performer and comes with a healthy 16MB of RAM, 540MB hard drive, two-year warranty. $1999. *Micro Express, 800/989-9900, 714/852-1400* **Reader service no. 786**

MPC TouchNote 799

PROS: Portable CD-ROM drive, sound, large hard disk
CONS: 2.5-hour battery, requires special external VGA adapter

DX4-100 notebook, 8MB of RAM, big 700MB hard drive, integrated audio capabilities, portable CD-ROM drive comes with an ISA adapter for sharing drive with a desktop PC, passive color display. $2750. *MPC Technologies, Inc., 800/672-8990, 714/724-9000* **Reader service no. 787**

Netis N566M

PROS: Very reasonable price along with very good level of performance for a Pentium-66 system
CONS: A one-year warranty is a minimal standard offering these days, some cable clutter inside compact case

Compact Pentium-66 comes with 8MB of RAM, 730MB hard drive, 15-inch monitor, and 2MB 64-bit PCI graphics controller. Nothing fancy, but a solid system. Priced just out of the running for the budget chart. $2279. *Netis Technology Inc., 800/577-7526, 408/263-0368* **Reader service no. 788**

NMC Expert System/N-100

PROS: Very reasonable price, system is very expandable with a minitower case that's particularly roomy inside
CONS: All the VL bus expansion slots are already filled, only a one-year warranty on parts, 14-inch monitor

This NexGen Nx586-P100 minitower yielded performance benchmarks comparable to those of a typical Pentium-90. Comes with just 8MB of RAM and a 540MB hard drive at this price, but you get a CD-ROM drive, sound card, and speakers. Almost made the Budget Desktops Top 20. $2245. *National MicroComputers, 800/800-4662, 801/265-3700* **Reader service no. 789**

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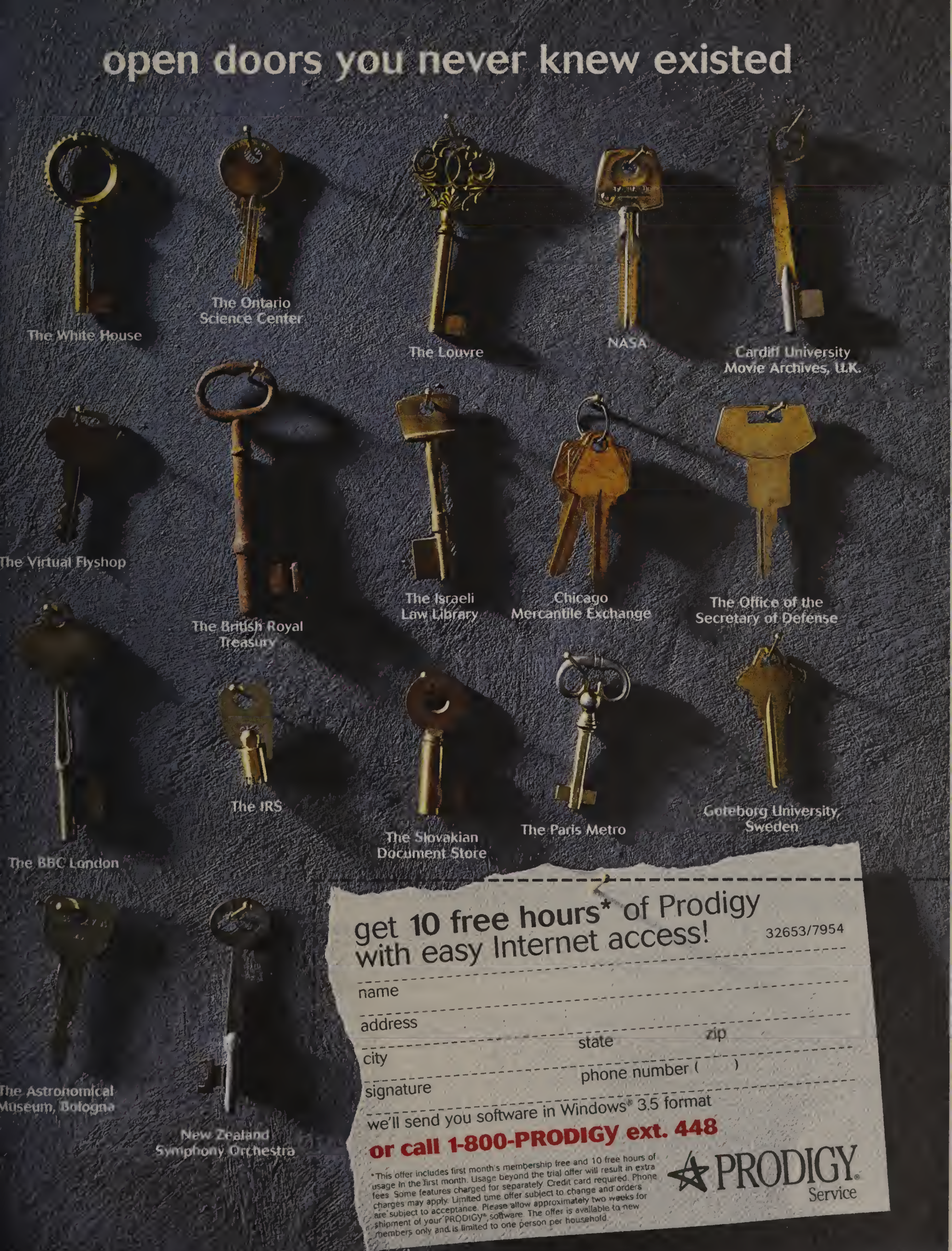

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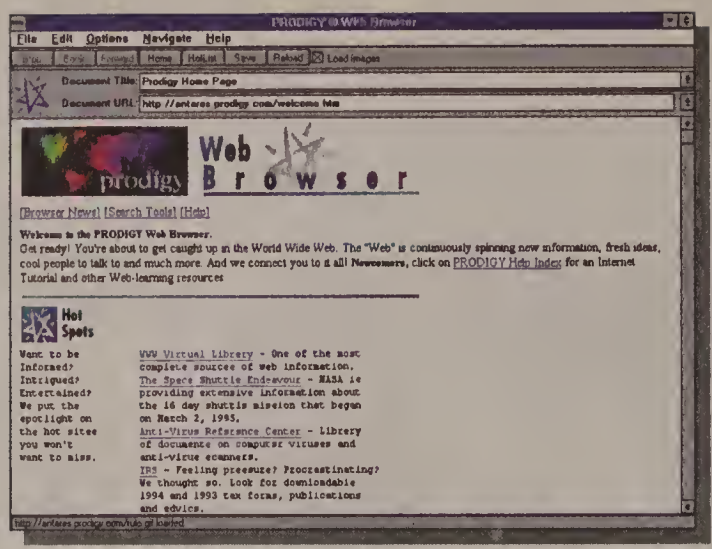

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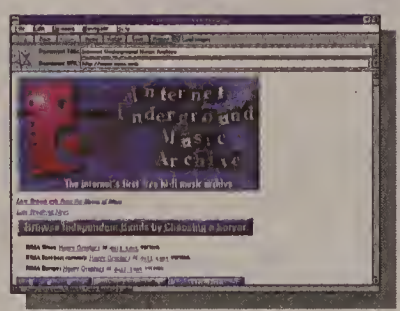
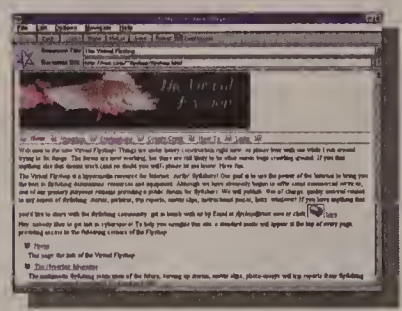


Hey, this is pretty cool. An Internet music store where you can hear bands you probably won't find in your local record shop! Wonder what else is out there?



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Sharp PC-8700

PROS: 5.8-hour battery, comfortable design, built-in audio

CONS: High price for a DX2-50 notebook with a small screen, a very modest hard drive, and no weekend technical support

486DX2-50 notebook, 8MB of RAM, just a 250MB hard drive, small 8.6-inch active-matrix screen, 5.8-hour battery life, 7.8 pounds, nice design, integrated mike and speakers. $3598. *Sharp Electronics Corp., 800/237-4277, 201/529-8200* **Reader service no. 790**

Sharp PC-8900

PROS: 4.5-hour battery, big clear display, built-in audio

CONS: Hefty 8-pound traveling weight

DX4-75 notebook, 8MB of RAM, 340MB removable hard drive, nice 10.4-inch active-matrix color display, built-in audio, infrared communications port for wireless data transfer with similarly equipped systems. $3899. *Sharp Electronics Corp., 800/237-4277, 201/529-8200* **Reader service no. 791**

Zeos Pantera P-120

PROS: 1083MB hard drive

CONS: Slow for a 120-MHz Pentium, one-year warranty

Pentium-120 tower with 16MB of RAM, 1083MB hard drive, 4X CD-ROM drive. System based on pre-Triton core logic performs slowly. Rumors suggest a newer, much faster 120 coming soon, with similar high expandability. $3695. *Zeos Int'l, 800/554-5220, 612/362-1234* **Reader service no. 792**

TEST REPORT This Month's Contenders

BEST BUY

Systems are arranged in order of overall performance from best to worst, based on the normalized, weighted scores from seven tests. A system may have a better overall performance rating than another system that took less time to complete our test suite.

Methodology

We tested each system as supplied by the manufacturer, using the version of DOS supplied. If we installed Windows, we used the default installation. We configured Windows with an HP LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. We set video resolution to 800 by 600 pixels in 256 colors using the supplied video driver where possible. We loaded the test applications and files and test automation software and scripts.

Word 2.0 for Windows

We worked with 1-, 9-, and 28-page business documents. Operations included creating, saving, opening, scrolling, editing, checking spelling, formatting, previewing, and printing.

Excel 4.0

We opened a file and performed several data extracts, entered new data, altered calculations, formatted, scrolled, moved blocks, previewed, printed, and saved.

Paradox 1.0 for Windows

We used a custom form to add a moderate number of records to an existing table, performed several queries, and generated a report.

Freelance 1.0 for Windows

We built a six-page presentation using a standard template, clip art, text, and charts; applied several views to the presentation; then previewed and saved it.

WordPerfect 6.0 for DOS

We performed a variety of editing, formatting, previewing, and printing tasks on documents ranging from a single-page memo to a long report. Due to memory requirements, the amount of free memory for DOS in the first 640K dramatically affects this test.

1-2-3 release 3.4 for DOS

Using the graphical Wysiwyg add-in and working in three different files, we created and altered formulas, built graphs, saved, and printed.

Paradox 3.5 for DOS

We tested Paradox 3.5 running under Windows in a DOS window. We entered data, searched records, updated, and generated reports from a simple customer list.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

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BOOM AND BUST

The consumer PC market is exploding—with it come service woes for home and business users alike. How big is the problem? Here's what our readers say.

Last year, while most of the country watched the Republican revolution unfold in Congress, the U.S. computer industry underwent a small revolution of its own as the personal computer took its place alongside the TV, the VCR, and the stereo in family rooms across the United States.

More personal computers went into U.S. homes in 1994 than ever before—more than 7.5 million, or about 40 percent of all PCs sold last year, according to International Data Corporation, a market research firm in Framingham, Massachusetts. Millions of home-PC buyers swarmed retail outlets and flooded mail-order phone lines looking for the multimedia system of their dreams. Along the way they found computers that doubled as answering machines, radios, televisions, and more.

BY DANIEL TYNAN

But as this latest analysis of responses to our *Reliability and Service Monitor* reveals, the boom in consumer computing has turned into a bust for many users, both at home and at the office. As PCs become do-everything appliances, making the parts work together becomes a huge challenge for hardware manufacturers. Consumers who find PCs to be far more trouble than advertised are flooding vendors with calls for help, and home and business users alike are finding support slow in coming.

A PC "is probably the most complex electronic device that many people have ever dealt with," notes Bruce Stephen, IDC's vice president of worldwide personal systems research. "As PCs drive further into the home and the number of first-time buyers increases, service and support [becomes] extremely important."

Between July 1994 and January 1995, *PC World* received completed questionnaires about more than 29,000 PCs. Readers detailed the reliability of their

computers, evaluated the quality of their PC maker's technical support and repair service, and rated their overall satisfaction. To ensure that our results reflect the experiences of current PC buyers, we winnowed the questionnaires to cover only PCs purchased after December 1992. From responses about that group of 18,000 PCs, we produced this comprehensive report on 23 top computer makers. Individual results and a detailed methodology appear in the "Reliability and Service Best to Worst" chart.

In general, respondents opted for the most powerful machines at the best price. More than 85 percent of the PCs bought since December 1992 are 486s or Pentiums, according to our poll. Approximately 40 percent of respondents purchased systems through the mail, and another 23 percent bought PCs at a local dealer. The rest got machines through computer superstores, electronics boutiques, direct sales, and other channels.

Unfortunately, many respondents discovered that trouble was part of the bargain. Slightly more than half of them reported at least one problem since they bought their PC, 75 percent of which were due to hardware glitches. Multimedia was one culprit; other hardware headaches involved standard system components such as hard drives, motherboards, monitors, and video cards.

And the more powerful the machine, the more often respondents found something wrong when they opened the box. For example: Nearly one out seven Pentium owners we heard from encountered some part of the machine dead on arrival, versus one out of ten 486 users. The two most troublesome components were video boards and CD-ROM drives.

Many respondents who called PC companies' support lines in 1994 encountered sluggish support. Overall, it took an average of nine days to fix a problem, and 1 in 12 respondents never got the problem solved. They reported more hassles reaching technicians and more unresolved problems last year than in 1993. Among respondents, Pentium buyers waited longest and were most likely to go without a solution.

Two factors combine to worsen the situation, says Bob Johnson, director of software services research for Dataquest, a research firm in Framingham: "Customers are throwing increasingly complex questions at hardware vendors, and the vendors are cramming everything under the sun into their machines."

Even worse, the most sophisticated systems, says Johnson, often end up in the hands of the least experienced users, a lethal combination for any vendor's support lines. "It's like giving a child a loaded gun."

According to Johnson, the number of calls to PC firms is increasing 20 percent per year. While all companies we contacted spent much of 1994 beefing up support staffs, many help lines remain swamped. The results: longer waits for everyone and more frustration across the board.

Highs and Lows

As reported in our last reliability and service analysis ("For Better or Worse," November 1994), Apple, AT&T, Compaq, and Hewlett-Packard make the most reliable machines. Dell and Digital Equipment Corporation, for the first time, also earn top honors in reliability. Respondents who bought computers from these companies were the least likely to encounter trouble over the life of their machines. On average, top-tier companies shipped some part dead on arrival 6.3 percent of the time, according to our respondents. On the other hand, bottom-tier companies racked up a 17.7 percent DOA rate.

Solid reliability often goes hand in glove with good service—the more reliable a company's machines, the less of a burden they create for tech support. That's a big reason why five (Apple, Compaq, Dell, Digital, and HP) of the six most reliable PC makers also registered top scores in service, along with Micron and NEC.

Nine out of ten Apple owners responding said they'd buy another machine from the company based on service received, while more than 80 percent of the Compaq, Dell,

I've learned patience—and that PCs will probably not be perfect right out of the box.

KEVIN KELLEY Quantex PC Owner

WINNERS AND LOSERS

Five top PC companies—Apple, Compaq, Dell, Digital Equipment Corporation, and Hewlett-Packard—provide the winning combination of excellent reliability and first-rate service, according to our analysis of recent responses to the *PC World Reliability and Service Monitor*. Other top contenders in individual categories: AT&T for reliability, and Micron and NEC for service.

Source: *PC World Reliability and Service Monitor*, July 1994 through January 1995. Desktop PCs only. Rankings reflect the opinions of questionnaire respondents only and are not projectable to a broader population. Reliability rankings are based on a company's scores in the following areas: the percent of respondents whose PC came dead on arrival, the percent who received a PC that had one or more individual components DOA (but not a whole system), and the percent with problems later in the life of their PC. Service rankings are based on scores in the following areas: the percent rating service better than average, the percent rating service worse than average, how long it took respondents to reach a person who could help them, the average time it took to resolve the problem being reported, the percent saying their problem was never resolved, and the percent who would buy the same brand again based on the service they received. Overall rankings are based on the sum of the total scores for service and reliability. See "Reliability and Service Best to Worst" for a full methodology.

Overall

BEST

Apple
Compaq
Dell
Digital
Hewlett-Packard

GOOD

AST
AT&T (NCR)
IBM
Micron
NEC

FAIR

Acer
DTK
Gateway 2000
Pionex
Quantex
Tandy
VTech

POOR

Compudyne
Insight
Leading Edge
Packard Bell
Zeos

WORST

Comtrade

Reliability

BEST

Apple (116 responses)
AT&T (NCR) (133)
Compaq (1244)
Dell (1417)
Digital (194)
Hewlett-Packard (208)

GOOD

AST (546)
IBM (1332)
NEC (153)

FAIR

Acer (350)
DTK (130)
Gateway (3278)
Micron (259)
Packard Bell (1182)
Pionex (180)
Tandy (155)
VTech (176)

POOR

Leading Edge (177)
Quantex (217)
Zeos (680)

WORST

Compudyne (221)
Comtrade (140)
Insight (113)

Service

BEST

Apple (22 responses)
Compaq (257)
Dell (364)
Digital (39)
Hewlett-Packard (40)
Micron (74)
NEC (44)

GOOD

AST (147)
IBM (355)
Quantex (69)

FAIR

AT&T (NCR) (29)
Compudyne (75)
Gateway (1021)
Insight (43)
Pionex (58)

POOR

Acer (109)
DTK (37)
Leading Edge (62)
Tandy (49)
VTech (62)
Zeos (225)

WORST

Comtrade (62)
Packard Bell (375)

and HP users would gladly become repeat customers. The same can't be said for Comtrade, the only company to land at the bottom of the heap in both categories. A scant 46 percent of respondents who received service from Comtrade said they'd buy a second machine from this clone vendor based in City of Industry, California.

Reliability and service are moving targets. A company's performance on these measures can be affected dramatically by sales growth, mergers, and shifts in the marketplace. That's why we've taken a deeper look at three companies that underwent significant changes in 1994—and that are likely to change even more over the next year.

Packard Bell's Shaky Rise

No company has ridden the consumer computing wave more skillfully than Packard Bell. According to IDC, the Westlake Village, California–based firm vaulted past IBM last year to rank as third-largest PC maker in the country, within spitting distance of Compaq and a hair behind Apple.

Packard Bell did it by dominating the mass market. Four of every ten PCs sold over retail counters last year were Packard Bell machines, making it the leading vendor to home and small-office users, according to Computer Intelligence InfoCorp, a research firm in La Jolla, California.

The company's success is even more remarkable when you consider its long-standing reputation for poor service. Based on responses to our questionnaire Packard Bell ranks near the bottom in every key support category—from the average time it took to reach a technician (40 hours) and resolve

Reliability and Service Best to Worst

Readers rate 23 companies in 9 key categories

Problem rate	System DOA rate	Component DOA rate	Time to talk	Time to resolve	Unresolved problems	Buy again based on service	Low satisfaction	High satisfaction
★★★★★ **BEST**								
Apple Almost perfect.	★★★★★	★★★★★	★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Compaq Still the reliability champ and among the best at service.	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★	★★★★★	★★★★
Dell High-quality PCs, backed by solid service keep Dell among the top companies.	★★★★	★★★★★	★★★★	★★★★	★★★★★	★★★	★★★★★	★★★★
Digital Excels at building reliable machines, and no slouch in the service department, either.	★★★★	★★★★★	★★★★★	★★★★	★★★★	★★★★★	★★★★	★★★★
Hewlett-Packard Minimal problems and fine service leave HP customers satisfied.	★★★★★	★★★	★★★★★	★★★	★★★★	★★★★	★★★★★	★★★★★
★★★★ **GOOD**								
AST Research A cut above average in almost every category.	★★★	★★★★★	★★★★	★★★	★★★★	★★★★	★★★★	★★★
AT&T (NCR) Few problems and even fewer service hassles, but buy-again score is only fair.	★★★★★	★★★	★★★★★	★★★★	★★★★	★★★★	★★★	★★★
IBM A so-so problem rate lands Big Blue in the second tier, despite otherwise excellent scores.	★★★	★★★★★	★★★★	★★★★★	★★★★	★★★★	★★★★	★★★★
Micron Leaves virtually no problem unsolved, though answers may be a long time in coming.	★★★	★★★★	★★	★★★★★	★★	★★★★★	★★★★	★★★★
NEC Good reliability and even better service.	★★★★	★★★	★★★	★★★	★★★★	★★★★★	★★★★	★★★★★

Methodology

The *Reliability and Service Monitor* is a monthly fax questionnaire bound into every issue of *PC World*. The rankings and scores presented in this article were generated by analyzing questionnaires returned to *PC World* between July 1994 and January 1995 that reported on approximately 18,000 PCs.

Because the *Reliability and Service Monitor* is not a random-sample survey, its results are not statistically projectable either to the larger base of *PC World* readers or to PC owners in general, and the results presented in this article are valid only as statements of the experiences of readers who returned a questionnaire. However, because the questionnaire is not inherently biased toward any brand, it provides valuable insight into relative differences between the companies reported on. And we mailed an identical questionnaire to a randomly selected group of subscribers and determined that measures of reliability and service in the random-sample questionnaire were comparable to those generated by the fax questionnaire.

To minimize the potential for reporting bias (such as receiving responses only from owners who had a problem), we offer a prize that all respondents are eligible to win. We also encourage readers to return the questionnaire even if their computer has been trouble-free.

We limit our reporting to companies that we have received at least 100 usable responses in order to minimize the possibility that a few angry customers could distort a company's results. We also note the number of responses for the service and the reliability rankings.

In this report, we limit our coverage to PCs purchased after December 1992. Although this reduces the number of usable responses for many companies, it allows us to focus on contemporary systems and service experiences.

SCORES AND RANKINGS

In each reliability and service category, we tabulated responses from customers of individual companies. We used these raw scores to rank each company on a scale from 1 to 5 (worst to best) in each category; the relative rankings are based on how a company's score compared with those of other companies in this report. Each company's raw category scores were then normalized, weighted, and summed to provide a reliability score and a service score.

To determine the reliability score for each company, we used raw scores from three categories: the percentage of respondents reporting one or more non-DOA problems (50 percent weighting); the percentage reporting a system-level DOA—that is, PCs with a faulty motherboard, CPU, hard drive, or power supply right out of the box (30 percent); and the percentage reporting other components DOA (20 percent).

To determine the service score for each company, only respondents reporting specifics about a service experience were counted. We used scores from six categories: the percentage reporting low satisfaction with service (10 percent weighting); the percentage reporting high satisfaction with service (10 percent); the average time it took to reach a person who could help (10 percent); the average time it took to resolve the problem (20 percent); the percentage who would buy the same brand again based on the service they received (20 percent); and the percentage saying their problem was never resolved (30 percent).

FAIR									
Acer Middle of the pack in just about every category, though too many problems are left unresolved.	★★★	★★★	★★★★	★★★	★★★	★★	★★★	★★★	★★★
DTK Quick to resolve, but long waits for assistance, and many customers give up in frustration.	★★	★★	★★★★	★	★★★★	★	★★★	★★★	★★★
Gateway 2000 Customers remain loyal despite high number of problems and sluggish support.	★★	★★★★	★★★	★★	★★	★★★★	★★★★	★★★	★★★
Pionex More problems than most, with many never resolved. Still, most customers would buy again.	★★	★★★★	★★	★★★★	★★★★★	★★	★★★★	★★★	★★★★
Quantex Newcomer to the ranks suffers from high number of system failures.	★★★★	★	★★	★★	★★★★	★★★★	★★★★	★★★★	★★★★
Tandy Reliability is average but service suffers, and few customers come back for seconds.	★★	★★★★★	★★	★★★★	★★	★★★	★	★	★★
Vtech Few systems DOA, but lots of other out-of-the box problems and long waits for support.	★★	★★★★★	★	★	★★	★★	★★★	★★★	★★

POOR									
Compudyne Fast service can't compensate for a disturbingly high number of problems.	★	★	★★★	★★★★★	★★★★	★★★★	★★★	★★★	★★★
Insight The worst DOA rate of the group, but able to solve most problems–eventually.	★★★	★	★	★★★★★	★	★★★★★	★★★	★★★	★★★
Leading Edge Numerous DOAs and unresolved problems leave many customers dissatisfied.	★★★	★	★★	★★★	★★★★	★	★★	★★	★★
Packard Bell The retail sales leader thrives despite high problem rates and terrible service.	★★	★★★	★★★★	★	★	★★	★	★	★
Zeos Lots of DOAs and slow service, but a surprisingly high buy-again rate.	★★	★★	★	★★	★	★★	★★★★	★★★	★★

WORST									
Comtrade In a class by itself.	★	★★★	★	★	★★	★	★	★	★

An overall ranking for each company was determined from the sum of its reliability and service scores. In the reliability, service, and overall categories, companies were again ranked on a scale of 1 to 5 and were divided into corresponding groups.

A company's score in individual categories, as well as its rank in the reliability, service, and overall categories, may have changed from our previous report because of an increase in the number of respondents, the restriction in analysis to newer PCs, and changes in our questionnaire and our scoring methodology.

THE STAR SYSTEM

Stars correspond to companies' relative rankings generated from raw scores in individual categories. Following are the ranges of raw scores in each of the nine categories.

PROBLEM RATE: The percentage of all respondents reporting one or more non-DOA hardware problems. Five stars: 23 to 35 percent. Four stars: 37 to 40 percent. Three stars: 42 to 45 percent. Two stars: 46 to 50 percent. One star: 59 to 60 percent.

SYSTEM DOA RATE: The percentage of respondents reporting one or more of the following components DOA: hard drive, motherboard, CPU, and power supply. Five stars: 0 to 2.4 percent. Four stars: 2.7 to 3 percent. Three stars: 3.3 to 3.8 percent. Two stars: 4.6 to 5 percent. One star: 5.4 to 8 percent.

COMPONENT DOA RATE: The percentage of respondents reporting one or more non–system-level components DOA. Five stars: 2.9 to 4.6 percent. Four stars: 5 to 6 percent. Three stars: 6.5 to 7.9 percent. Two stars: 8.3 to 9.7 percent. One star: 12.1 to 16.8 percent.

TIME TO TALK: How long respondents reporting problems said it took to reach a support staffer who could help. Five stars: 12 to 18 hours. Four stars: 20 to 24 hours. Three stars: More than 24 to 30 hours. Two stars: 34 to 35 hours. One star: 38 to 46 hours.

TIME TO RESOLVE: How long respondents reporting hardware problems said it took to resolve them. Five stars: 4⅔ to 6⅔ days. Four stars: 7⅓ to 8⅓ days. Three stars: 9⅓ days. Two stars: 10⅓ to 11 days. One star: 11⅓ to 11⅔ days.

UNRESOLVED PROBLEMS: The percentage of respondents reporting problems and obtaining service who said the problems were never resolved. Five stars: 1.4 to 4.9 percent. Four stars: 5.1 to 7.2 percent. Three stars: 7.8 to 9.1 percent. Two stars: 11.1 to 14 percent. One star: 16.4 to 16.9 percent.

BUY AGAIN BASED ON SERVICE: The percentage of respondents reporting on service who said they would buy from the company again based on the service they received. Five stars: 84 to 90 percent. Four stars: 71 to 80 percent. Three stars: 61 to 68 percent. Two stars: 55 percent. One star: 45 to 48 percent.

LOW SATISFACTION: The percentage of respondents reporting lower-than-average satisfaction with service. Five stars: 8 to 14 percent. Four stars: 16 to 20 percent. Three stars: 25 to 33 percent. Two stars: 38 percent. One star: 43 to 47 percent.

HIGH SATISFACTION: The percentage of respondents reporting higher-than-average satisfaction with service. Five stars: 61 to 68 percent. Four stars: 51 to 58 percent. Three stars: 40 to 49 percent. Two stars: 35 to 38 percent. One star: 25 to 27 percent.

My wife and I must have made six calls. Each took at least 45 minutes just to talk to a human.

MARK BLANCHET
Packard Bell PC Owner

problems (almost 12 days) to how many problems never got solved (13 percent).

"There's a perception among buyers that Packard Bell does not respond in a timely manner," notes Merridee Matson, vice president of Channel Marketing Corporation, a sales research firm in Dallas. "People want instant gratification, and when they can't get it they're very unhappy."

Just ask Mark Blanchet, a 33-year-old baker in Dearborn Heights, Michigan, whose Packard Bell 486-33 began producing a steady stream of General Protection Faults last summer.

"My wife and I must have made six calls," Blanchet says. "Each took at least 45 minutes just to talk to a human." Every time, a support technician insisted it was a software problem and told Blanchet to reinstall Windows. After almost three months of wrangling, Blanchet finally convinced the company to send a technician to his home. The culprit: a faulty motherboard.

Packard Bell executives cite two reasons for the company's slow response times. One is the January 1994 earthquake in the Los Angeles area that leveled most of the company's support operations. Technical support services were down for three weeks while the company readied a new facility. One month after the temblor, Packard Bell's new Magna, Utah, center was operating at capacity, but customers continued to feel the aftershocks for months.

The other reason for poor response time is the company's tremendous growth. "It's not just an earthquake that can make you slow, it's also the market," says vice president of marketing Mal Ransom. "We don't have a technical issue with providing support, we have a volume issue."

Ransom grades Packard Bell's support efforts as "a C, moving towards an A...we are certainly on the road to getting to that A position." Last year the company increased its support staff from 800 employees to more than 1100—or about 25 percent of all personnel. According to John Hlavac, Packard Bell vice president of international service and support, the company has managed to reduce average hold times to less than 3 minutes.

But while last year's earthquake and tremendous growth hurt Packard Bell's support operations, they merely made a bad situation worse. Even in 1993, the firm's support was still far below the average for companies in our questionnaire. The price for poor support is low customer satisfaction: Fewer than half of Packard Bell owners responding to our questionnaire said they'd buy another of the company's machines, based on the service they received.

Although Packard Bell sales continue to explode, a similar backlash among consumers at large could hurt Packard Bell in the long run, says Matson. "On the other hand, if the company beefs up its customer support and customer relations, it could stay right where it is. But it's got healthy competition from some top-notch companies."

Micron and Zeos: Merging at High Speed

When it comes to support, Micron Computer has long been a favorite of *PC World* readers. Even when users encounter problems, they respond warmly to Micron's friendly and efficient service.

Take Mark Hollenbeck, a 33-year-old financial systems consultant in Tacoma, Washington. When his new Micron 486-66 arrived in April 1994, he discovered that its Chinon CD-ROM drive worked only intermittently—and neither he nor the Micron technician he talked to could figure out why.

"Rather than waste everyone's time looking for the problem, they just replaced it," Hollenbeck says. When the new drive arrived the next day, he called again and had a technician walk him through the installation process. The whole experience, he says, gave him a "warm and fuzzy feeling" about the company—a sentiment shared by other respondents, who give Micron high marks for customer satisfaction.

Despite rapid growth, Micron continues

JON MURESAN

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to score at the top of our service rankings and is showing gradual improvement in its reliability score. But in our most recent questionnaire, the Nampa, Idaho, mail-order company stumbled in a few key areas. Micron's overall DOA rate is only slightly higher than the average, according to our poll. But Micron owners reported higher-than-average DOA rates for key components, including hard drives, floppy drives, and CD-ROM drives. CD-ROM drives are standard in Micron's Pentium systems, which may account for the higher DOA rate for this component. And while Micron has the best record for fixing problems—more than 98 percent are solved—the company takes longer than average to do it, frequently more than 10 days.

The biggest challenge for Micron is yet to come. In April, parent company Micron Technology—a $1.6 billion Boise, Idaho–based firm whose main business is manufacturing memory chips—merged its Micron Computer subsidiary with financially troubled Zeos International. Zeos has had a steady slide in our reliability and service questionnaires and now ranks as poor for both reliability and service. The Minneapolis mail-order vendor also has a high rate of DOA components and long resolution times among our respondents. Can the combined entity improve its weak areas, or will the merger just make things worse?

The merger might actually improve both firms, IDC's Bruce Stephen speculates, thanks to increased purchasing power and greater economies of scale. The final result may depend on whether Micron Technology decides to combine the two companies' manufacturing and support operations. At press time, Micron had said that it was planning to keep the Zeos and Micron operations separate.

The winners in this battle may not be the companies with the fastest machines at the lowest price, but the ones whose systems present the fewest headaches.

Quantex: Out of the Blue

No company has made a more dramatic entrance into our reliability and service report than Quantex. The Somerset, New Jersey, mail-order company went from relative obscurity to one of the top 12 vendors in responses received. Quantex's sudden popularity is partially due, we suspect, to a flashy, Gateway-style advertising campaign; it has also received a slew of Best Buys from *PC World*. According to vice president of sales and marketing James Wang, the company grew 70 percent last year, largely by offering hot new systems at fire-sale prices.

But the news isn't entirely good. Nearly 17 percent of all Quantex owners who responded to our survey said their systems did not work when they opened the box—the experience of Kevin Kelley when he set up his new Quantex Pentium in January 1994. The 36-year-old trading assistant from Falls Church, Virginia, says that when he plugged in the machine, the screen was "jumpy" and the power supply gave off "a loud whine—the kind of annoying glitch that made you want to bury the thing in pillows."

When Kelley called Quantex, the company immediately sent him another monitor and a power supply. But the monitor was a year old, and the power supply was for a different machine. Another call got him a new monitor and another wrong power supply. More calls and one on-site visit later, Kelley finally got the computer he'd paid for.

What did Kelley learn from his experience? "Patience," he says. "I also learned that PCs will probably not be perfect right out of the box."

Wang acknowledges Quantex's problems with DOAs in the past but doesn't believe the company's current DOA rate is "noticeable." He also points out that Quantex is applying for ISO 9000 certification, an international standard for quality control.

You Say You Want a Revolution?

While the revolution in consumer computing is under way, many battles remain to be fought as PC makers attempt to fulfill their own contract with America.

"We need to be able to tell people that a personal computer is as easy to use as a microwave oven or a telephone," says Mark Vena, product manager for Compaq's Presario line of consumer PCs. But, he concedes, "the entire industry has a long way to go before we get there."

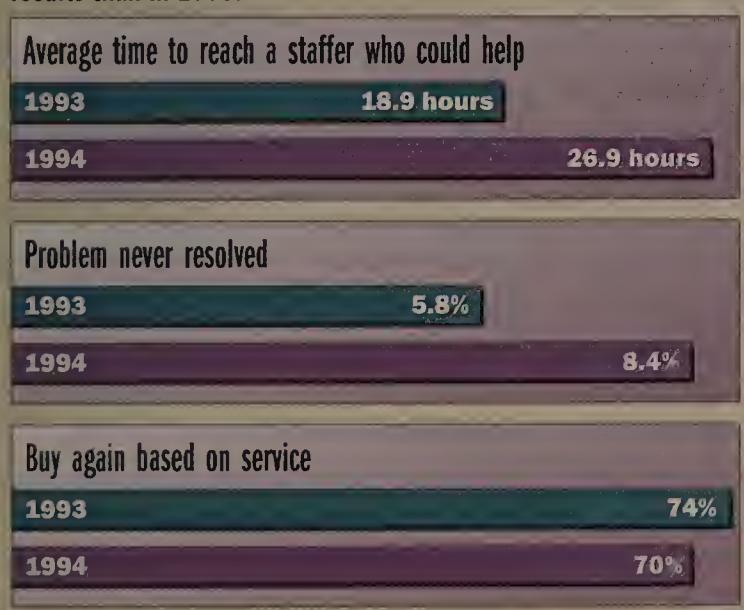
The winners in this battle may not be the companies with the fastest machines at the lowest price, but the ones whose systems present the fewest headaches and whose support departments answer the phone quickly when trouble strikes.

As consumer PC sales continue to rise, "service and support is going to become even more important," says Channel Marketing's Matson. "Companies that don't provide it are not going to be around."

Contributing Editor Daniel Tynan cowrote PC World's *last two reports on PC reliability and service, for which* PC World *won a Jesse H. Neal Editorial Achievement Award.*

Longer Waits, Fewer Answers, Lower Satisfaction

As consumers flooded the phone lines of PC companies in 1994, they waited longer for service and were less satisfied with the results than in 1993.



Source: PC World Reliability and Service Monitor. *Results reflect the experiences of respondents only and are not projectable to a broader population. For full methodology, see "Reliability and Service Best to Worst."*

RELIABILITY AND SERVICE ON THE GO

Notebook-toting business travelers find that life on the road can be anything but trouble-free. By Mike Hogan

Consider this scenario: You're on the road, trying to cram several days' worth of work in the breaks between meetings. Your notebook computer—your umbilical cord to the main office—suddenly decides to give up the ghost. You call the manufacturer's tech support line and discover you need a new hard drive and will be without your notebook for at least a couple of days.

So much for sanity.

Judging from the results of the *PC World Reliability and Service Monitor*, many notebook owners are finding that working with today's portables presents a new class of technical problems; 58 percent of notebook owners who filled out a questionnaire between July 1994 and January 1995 reported at least one hardware or software problem.

Our respondents detailed for us their after-sale support experiences—good, bad, and ugly—with more than 40 notebook makers. But because Compaq, IBM, and Toshiba dominate the notebook market, only they garnered enough responses to provide detailed information. We therefore focused our discussion on average responses for the industry, noting how the top three companies stack up in our nine reliability and service categories.

Here a Problem, There a Problem

Nearly one in ten respondents reported that their new notebook came with one or more dead components right out of the box. Owners of Compaq, IBM, and Toshiba notebooks reported better-than-average DOA rates: Compaq and IBM each score 7.6 percent; Toshiba scores 7.2 percent. (These figures combine the DOA rates for critical system elements such as motherboards with the rates for components.) The low rates of these three high-volume companies, however, distort the industry average, masking a much poorer track record among other vendors. With notebooks from other companies, DOA rates of 15 percent or more are not uncommon in our respondents' experience.

The good news is, the components most likely to be DOA also happen to be the easiest ones to replace—battery (16 percent of all DOAs), fax-modem (17 percent), and pointing device (10 percent). Fixes involve a relatively easy swap-out of the components, which are usually supplied by third-party manufacturers.

Significantly, critical notebook elements—motherboards, hard drives, CPUs, and video subsystems—have relatively low initial failure rates. After a period of use, a few more motherboards and hard drives go south, but not many; only 7.8 percent of respondents reporting a problem had trouble with either of these components after first setting up their notebook. Batteries, fax-modems, and pointers, however, continue to be problematic—representing 9.4 percent, 6.8 percent, and 8.1 percent, respectively, of all post-setup problems.

Trackballs and eraser-type pointers are, of course, the most used—and the most abused—moving parts in a notebook, meeting greasy fingers, bumps, and unidentified gunk on a daily basis. Fax-modems, on the other hand, are third-party add-ins with few true hardware failures but with a bedeviling number of address and PC Card and Socket Services conflicts.

RON CHAN

At a Glance: Reliability and Service for Top Three Notebook Makers

Though Toshiba notebook owners report slightly lower problem and overall DOA rates than Compaq and IBM owners, they didn't fare as well in most service categories.

	Problem rate	System DOA rate	Component DOA rate	Time to talk	Time to resolve	Unresolved problems	Buy again based on service	Low satisfaction	High satisfaction
Compaq	53%	1.3%	6.3%	13 hours	8¼ days	3.2%	93%	11%	52%
IBM	46%	1.4%	6.2%	9 hours	6¾ days	5.8%	89%	12%	66%
Toshiba	42%	0.8%	6.4%	22 hours	15 days	4.8%	81%	32%	47%
All notebooks	54%	1.8%	7.8%	17 hours	10½ days	6.8%	77%	22%	52%

Source: PC World Reliability and Service Monitor, July 1994–January 1995. Results reflect questionnaire responses only and are not projectable to broader population. Number of respondents: Compaq, 238; IBM, 211; Toshiba, 250; all notebooks, 1570.

Batteries are a more complicated issue, as Gary Elsasser, Toshiba's director of product planning, explains. Quick-charging a battery incorrectly can shorten its life, as can the surges and spikes that typically come out of a wall socket, says Elsasser. Heat and improper voltage levels from the power supply can also wreak havoc with batteries.

In any case, more than 86 percent of all problems reported in our survey happened while the notebook was under warranty.

Service When It Counts

When something does go wrong, help may be just a phone call away. About 62 percent of the notebook owners who filled out the service portion of the questionnaire used phone service, while slightly more than 38 percent had to return their notebook to the store or factory for repairs. Just over 14 percent of customers had a technician come to them to fix the problem. Many customers reported using more than one type of service before they got their problem fixed.

How long does it take to get a problem resolved, on average? Unlike in the bad old days, you'll spend only a little more than 7 minutes on hold before talking to someone. Then again, talking isn't the same as solving your problem. Almost 17 hours went by before the average respondent to our survey found the person who could solve their problem. It was easier to find the right IBM technician, a feat our respondents accomplished in a relatively quick 9 hours. It took almost 13 hours with Compaq and more than 22 hours with Toshiba.

On average, it took respondents more than 10 days to get their problems resolved. Here again, Compaq and IBM customers reported better-than-average service, while Toshiba owners reported much slower repair times. If your notebook is your primary computer, as it is for most of our respondents, consider opting for a 24-hour replacement guarantee—an option that is now being offered by some of the larger vendors.

Among all the companies, an average of almost 7 percent of respondents reporting a problem said they never got the problem resolved—they just gave up. On the other hand, 85 percent of respondents said that their problems were eventually resolved to their satisfaction—92 percent of Compaq customers were satisfied, as were 85 percent of IBM and Toshiba customers. On average, 77 percent of our respondents who reported their service experience said they would buy a notebook PC again from the same company based on the service they received, with customers of the top three makers all reporting higher-than-average buy-again rates.

The Good, the Bad

Notebook design is a moving target. Considering its complexity and the pace of change in nearly every component, a notebook will probably never be as reliable as your refrigerator or TV, whose core technologies haven't changed much in 20 years. It's likely that more than half of you will experience some technical problem during your notebook's lifetime.

When that day arrives, even the most responsive notebook maker falls below what we consider to be an acceptable level of customer support. Notebook makers, on average, take nearly 1.4 days longer to fix a unit than their desktop counterparts. Even the relatively fast 7-day turnaround reported for IBM just isn't good enough for business travelers who depend heavily on their notebooks on the road.

Considering its complexity and the pace of change, a notebook computer will probably never be as reliable as your refrigerator or your TV.

While you may not be able to do much about improving the reliability and service of notebook makers, you can do your part to make sure *PC World*'s next report includes detail on more than just the top three vendors. In this issue, we're running our first *Reliability and Service Monitor* designed exclusively for notebook owners. Whether you're always on the road or you travel infrequently, we want to hear about *your* experience with your portable. As always, we'll compile the data and report on it in an upcoming issue.

Mike Hogan is a freelance writer based in Woodland Hills, California.

Win a Polywell Poly 486-80 VB

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Polywell Poly 486-80VB, a Best Buy Am486DX2-80 PC.

HOW TO ENTER: Fax your completed questionnaire to *PC World* at 415/974-7367. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 6-SS, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by June 30.

PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact prize winners at the telephone and fax numbers they provide. If *PC World* is unable to do so within 30 days of the drawing, a substitute winner will be selected. No purchase necessary. Void where prohibited by law.

HOW TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER — —

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
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7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

How did you get this copy of *PC World*?
○ By subscription ○ On the newsstand ○ From someone else

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

○ Acer	○ Compudyne	○ Future Tech	○ Mitac	○ Tangent
○ Acma	○ Comtrade	○ Gateway 2000	○ NEC	○ Texas Instruments
○ ALR	○ Cornell	○ Hewlett-Packard	○ Netis	○ Toshiba
○ Apple	○ CTX	○ Hyundai	○ Packard Bell	○ Tri-Star
○ AST	○ Dell	○ IBM	○ Panasonic	○ Twinhead
○ AT&T (NCR)	○ Diamond	○ Insight	○ Pionex	○ USA Flex
○ Austin	○ Digital (DEC)	○ Intelesys	○ Polywell	○ VTech (Expotech, Laser)
○ Axik	○ DTK	○ Leading Edge	○ Quantex	○ Winbook
○ Blackship	○ Eltech	○ Micro Express	○ Samsung	○ Zenith (ZDS)
○ Canon	○ EPS	○ Micron	○ Sharp	○ Zenon
○ Compaq	○ Epson	○ Midwest Micro	○ Swan	○ Zeos
○ CompuAdd	○ Everex	○ MIS	○ Tandy	○ Other

What size is this PC?
○ Desktop
○ Notebook/laptop
○ Hand-held

What is the CPU?
○ PowerPC
○ Pentium
○ 80486
○ 80386
○ Other

Where did you buy this PC?
○ Local dealer
○ Mail/phone order
○ Direct from field sales force
○ Membership discount store
○ Computer superstore
○ Home electronics store
○ Retail store
○ Value-added reseller
○ Other

After ordering, how long did it take to get your PC?
○ Less than 1 week
○ 1–2 weeks
○ 3–4 weeks
○ More than 4 weeks

Who set up your PC?
○ Dealer/retailer/VAR
○ Staff computer technician
○ Self or coworker

WHEN YOU FIRST GOT YOUR PC

When did you buy this PC? (Specify month and year.)

○ Jan	○ Mar	○ May	○ July	○ Sept	○ Nov	○ 90	○ 92	○ 94
○ Feb	○ Apr	○ June	○ Aug	○ Oct	○ Dec	○ 91	○ 93	○ 95

When you first set up your PC, were any components "dead on arrival" (DOA)?
○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)

○ Battery	○ Graphics/video board	○ Modem/fax board	○ Power supply
○ CD-ROM	○ Hard drive	○ Monitor/screen	○ Sound board
○ CPU	○ Keyboard	○ Motherboard	○ Other
○ Floppy drive	○ Memory	○ Mouse	

Did your problem occur only after you added your own hardware or software?
○ Yes ○ No ○ Don't know

Would you buy this brand of PC again?
○ Yes ○ No ○ Not sure

How many times have you had a problem with this PC?
○ No problem ever ○ Three
○ One ○ Four
○ Two ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Please answer for the most recent problem—*other than DOA*—not reported in a previous survey.

When did this problem occur? (Specify month and year.)

○ Jan	○ Mar	○ May	○ July	○ Sept	○ Nov	○ 90	○ 92	○ 94
○ Feb	○ Apr	○ June	○ Aug	○ Oct	○ Dec	○ 91	○ 93	○ 95

How long was this after you purchased your PC?
○ Less than 1 month ○ 4–6 months ○ More than 12 months
○ 1–3 months ○ 7–12 months ○ Not sure

Did the problem occur as a result of adding new hardware or software?
○ Yes ○ No ○ Don't know

Did the problem occur under warranty?
○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)
○ Faulty component ○ Wrong configuration ○ Device conflicts ○ Other
○ Incorrectly installed software ○ Faulty peripheral ○ OS problem ○ Don't know

If a component failed, which one was it? (Mark all that apply.)

○ Battery	○ Graphics/video board	○ Modem/fax board	○ Power supply
○ CD-ROM	○ Hard drive	○ Monitor/screen	○ Sound board
○ CPU	○ Keyboard	○ Motherboard	○ Other
○ Floppy drive	○ Memory	○ Mouse	

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your PC?
○ Manufacturer
○ Dealer/store where purchased
○ Manufacturer's authorized repair technician
○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)
○ Phone ○ System swap
○ On site ○ Component swap
○ In store ○ Factory return

If you received phone service, how long were you on hold?
○ Not at all ○ 1–2 minutes ○ 6–10 minutes ○ More than
○ Less than 1 minute ○ 3–5 minutes ○ 11–20 minutes 20 minutes

How long did it take before you talked to the person who finally helped you?
○ Less than 15 minutes ○ 2–5 hours ○ 11–24 hours ○ 3–5 days
○ 15 minutes–1 hour ○ 6–10 hours ○ 1½–2 days ○ 1 week or more

How long did it take to resolve the problem completely?
○ 1–2 days ○ More than 1 month
○ 3–7 days ○ Never resolved
○ 1½–4 weeks ○ Awaiting resolution

Was the problem resolved to your satisfaction?
○ Yes ○ No

How would you rate the person(s) who helped you?

	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of PC again?
○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?
○ Not at all ○ ○ Satisfied ○ ○ Extremely satisfied

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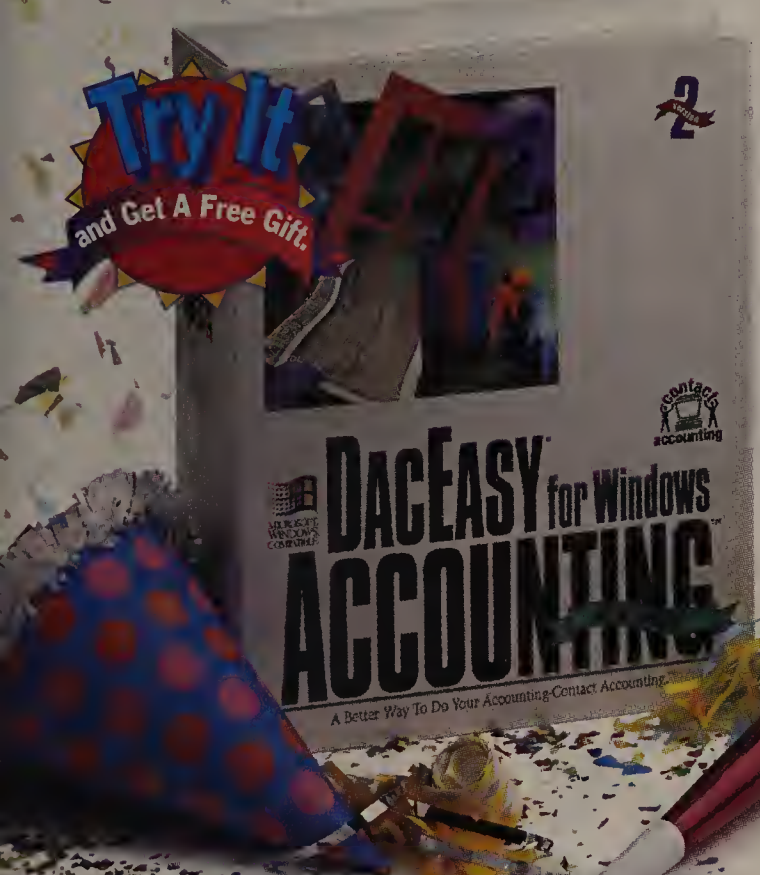

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PC World, February 1995

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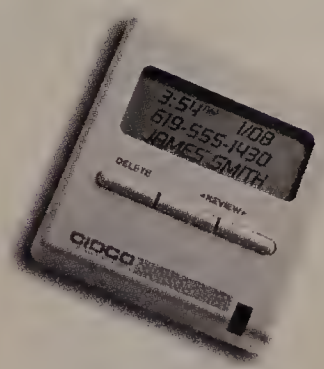

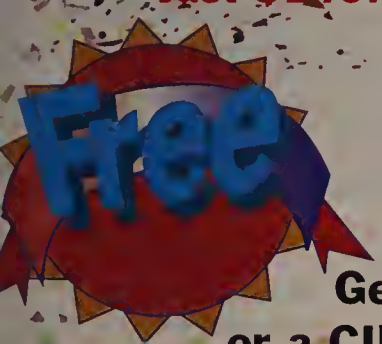

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NOTEBOOK RELIABILITY AND SERVICE MONITOR

Win a Compaq Contura 400c

Have you ever contacted your notebook maker for service and support? Or has your notebook been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Top 20 Best Buy notebook.

HOW TO ENTER: Fax your completed questionnaire to *PC World* at 415/974-7367. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 6-NB, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by June 30.

PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact prize winners at the telephone and fax numbers they provide. If *PC World* is unable to do so within 30 days of the drawing, a substitute winner will be selected. No purchase necessary. Void where prohibited by law.

HOW TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER — —

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

How did you get this copy of *PC World*?
○ By subscription ○ On the newsstand ○ From someone else

ABOUT YOUR NOTEBOOK

Who is the manufacturer of your notebook?

○ Acer	○ BSI	○ Eltech	○ Mitac	○ Texas Instruments
○ Acma	○ Canon	○ EPS	○ NEC	○ Toshiba
○ Acom	○ Compaq	○ Epson	○ Packard Bell	○ Tri-Star
○ ALR	○ CompuAdd	○ Everex	○ Panasonic	○ Twinhead
○ AMS	○ Compudyne	○ Future Tech	○ Pionex	○ USA Flex
○ Apple	○ Comtrade	○ Gateway 2000	○ Polywell	○ VTech (Expotech, Laser)
○ Arm	○ CTX	○ Hewlett-Packard	○ Samsung	○ WinBook
○ Aspen	○ Dell	○ Hyundai	○ Sceptre	○ Zenith (ZDS)
○ AST	○ DFI	○ IBM	○ Sharp	○ Zenon
○ AT&T (NCR)	○ Digital (DEC)	○ Micro Express	○ Swan	○ Zeos
○ Austin	○ DTK	○ Micron	○ Tandy	○ Other
○ Axik	○ Duracom	○ MidWest Micro	○ Tangent	

What size is this portable?
○ Notebook/laptop
○ Handheld

What is the CPU?
○ Pentium
○ 80486
○ 80386
○ Macintosh
○ Other

Where did you buy this notebook?
○ Local dealer
○ Mail/phone order
○ Direct from field sales force
○ Membership discount store
○ Computer superstore
○ Home electronics store
○ Retail store
○ Value-added reseller
○ Other

After ordering, how long did it take to get your notebook?
○ Less than 1 week
○ 1–2 weeks
○ 3–4 weeks
○ More than 4 weeks

Who set up your notebook?
○ Dealer/retailer/VAR
○ Staff computer technician
○ Self or coworker

WHEN YOU FIRST GOT YOUR NOTEBOOK

When did you buy this notebook? (Specify month and year.)

○ Jan	○ Mar	○ May	○ July	○ Sept	○ Nov	○ 90	○ 92	○ 94
○ Feb	○ Apr	○ June	○ Aug	○ Oct	○ Dec	○ 91	○ 93	○ 95

When you first set up your notebook, were any components "dead on arrival" (DOA)?
○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)

○ AC adapter	○ Floppy drive	○ Modem/fax board	○ Screen
○ Battery	○ Hard drive	○ Motherboard	○ Other
○ CPU	○ Keyboard	○ PC Card slot	
○ Docking station	○ Memory	○ Pointing device	

Did your problem occur only after you added your own hardware or software?
○ Yes ○ No ○ Don't know

Would you buy this brand of notebook again?
○ Yes ○ No ○ Not sure

How many times have you had a problem with this notebook?
○ No problem ever ○ Three
○ One ○ Four
○ Two ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Please answer for the most recent problem—*other than DOA*—not reported in a previous survey.

When did this problem occur? (Specify month and year.)

○ Jan	○ Mar	○ May	○ July	○ Sept	○ Nov	○ 90	○ 92	○ 94
○ Feb	○ Apr	○ June	○ Aug	○ Oct	○ Dec	○ 91	○ 93	○ 95

How long was this after you purchased your notebook?
○ Less than 1 month ○ 4–6 months ○ More than 12 months
○ 1–3 months ○ 7–12 months ○ Not sure

Did the problem occur as a result of user mishandling?
○ Yes ○ No ○ Don't know

Did the problem occur under warranty?
○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)
○ Faulty component ○ Wrong configuration ○ Device conflicts ○ Other
○ Incorrectly installed software ○ Faulty peripheral ○ OS problem ○ Don't know

If a component failed, which one was it? (Mark all that apply.)

○ AC adapter	○ Floppy drive	○ Modem/fax board	○ Screen
○ Battery	○ Hard drive	○ Motherboard	○ Other
○ CPU	○ Keyboard	○ PC Card slot	
○ Docking station	○ Memory	○ Pointing device	

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your notebook?
○ Manufacturer
○ Dealer/store where purchased
○ Manufacturer's authorized repair technician
○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)
○ Phone ○ System swap
○ On site ○ Component swap
○ In store ○ Factory return

If you received phone service, how long were you on hold?
○ Not at all ○ 1–2 minutes ○ 6–10 minutes ○ More than
○ Less than 1 minute ○ 3–5 minutes ○ 11–20 minutes 20 minutes

How long did it take before you talked to the person who finally helped you?
○ Less than 15 minutes ○ 2–5 hours ○ 11–24 hours ○ 3–5 days
○ 15 minutes–1 hour ○ 6–10 hours ○ 1½–2 days ○ 1 week or more

How long did it take to resolve the problem completely?
○ 1–2 days ○ More than 1 month
○ 3–7 days ○ Never resolved
○ 8–14 days ○ Awaiting resolution
○ 15–30 days

Was the problem resolved to your satisfaction?
○ Yes ○ No

How would you rate the person(s) who helped you?

	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of notebook again?
○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?

○	○	○	○	○
Not at all		Satisfied		Extremely satisfied

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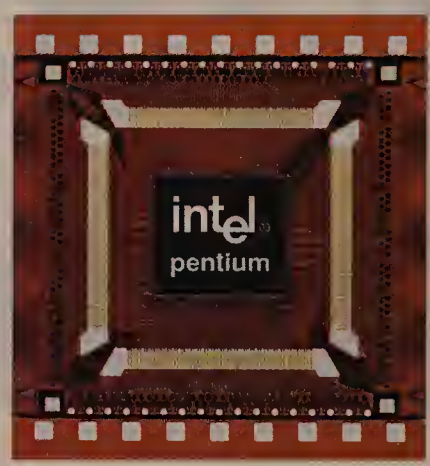

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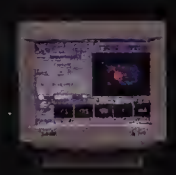

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Top 10 Windows Accelerators: Terminator Triumphs

You don't have to pay an arm and a leg for lightning-fast graphics—that's the lesson from this month's crop of impressive Windows accelerators. It once took $400 or more to buy top-flight performance, as the fastest boards employed expensive VRAM to achieve speed. Now affordable DRAM boards challenge the fastest VRAM products, often at street prices below $200. Our new number one—the $199 Hercules Terminator 64 DRAM—is the first DRAM board to claim the title "fastest ever," with an incredible 82.1 score in *PC World*'s Windows Integrated Test Suite (WITS). Based on the same Trio64 graphics chip found on the number two STB Powergraph 64 and number four Diamond Stealth 64 DRAM, this 2MB PCI board uses its Hercules Touch graphics software to change resolution and color depth, set power-saving DPMS controls, and zoom.

The Terminator 64 DRAM is the fastest ever, with an 82.1 WITS score.

The PCI-based FireStorm64 makes an impressive debut for rPC, placing third on our Top 10. At $180 on the street, this 2MB product is priced to sell, and its 79.9 WITS score is the fastest of any Vision864-based board. The FireStorm64's slick installation augments an exhaustive database of monitor settings, and a profiler function helps it work with monitors not on its installed list of displays by testing graphics modes before resetting Windows. rPC's ControlDesk software lets you control DPMS settings and create hot keys for tricks like panning and zooming, while color calibration helps match monitor colors to printer output.

Bargain hunters will love the stripped-down PCI-based Cardex Trio64 from CardExpert Technologies. Another Trio64-based product, its 78.8 WITS score lagged behind the Terminator 64 DRAM, but you can't beat the $169 price. It placed ninth on our list despite its minimal software and bare-bones service and support policies. Finally, there's the PCI-version of the UMAX MaxMedia CX/24, a 6MB DRAM board for publishing pros who work in 24-bit color. With three S3 Vision864 chips, this board scored an 80.6 WITS score at 8-bit color and excelled at 24 bits as well. But at $1299, it's too steep.

WITS was developed by Jon Peddie Associates, a PC graphics consulting firm. Jon Peddie and Fred Dunn are the firm's principal officers.

TOP 10 ACCELERATORS

New this month
Up from last month
No change from last month
Down from last month

			Overall value	Estimated street price	Windows Integrated Test Suite scores: Word 2.0 for Windows	Excel 4.0	CorelDraw 3.0	PhotoStyler 1.1	QuarkXPress 3.11	Freelance Graphics 2.01	Overall WITS score	RAM (MB/type)[1] Bus type	Chip Driver date	Reader service number
1	New	Hercules Terminator 64 DRAM 800/532-0600	100	$199	14.3	17.3	13.7	12.8	17.0	7.0	82.1	2 / D PCI	Trio64 2/16/95	610
2	Down	STB Powergraph 64 800/234-4334	99	$180	13.6	16.5	13.7	11.7	16.7	6.1	78.2	2 / D PCI	Trio64 7/11/94	611
3	New	rPC FireStorm64 800/541-7680	98	$200	13.9	16.9	13.8	11.6	17.0	6.8	79.9	2 / D PCI	Vision864 3/1/95	612
4	Down	Diamond Stealth 64 DRAM [2] 800/468-5846	96	$219	14.2	17.1	14.3	11.7	16.8	6.1	80.1	2 / D PCI	Trio64 10/29/94	613
5	Down	Paradise Bahamas 64 800/568-9272	96	$179	13.7	16.4	13.3	11.3	16.6	6.3	77.4	2 / D PCI	Vision864 7/11/94	614
6	Down	ATI Graphics Xpression 905/882-2600	95	$209	13.4	16.6	13.2	11.6	15.6	4.8	75.1	2 / D PCI	88800CX 4/11/94	615
7	Up	Hercules Stingray 64 800/532-0600	94	$179	13.8	16.0	13.7	11.8	16.0	3.8	75.0	2 / D PCI	Ark2000PV 10/27/94	616
8	Down	STB Powergraph Pro 800/234-4334	93	$219	12.8	15.6	12.2	11.7	14.6	6.6	73.4	2 / D PCI	Vision864 5/9/94	617
9	New	Cardex Trio64 510/252-1118	93	$169	13.7	17.1	13.3	11.7	16.8	6.2	78.8	2 / D PCI	Trio64 10/13/94	618
10	Down	STB LightSpeed 800/234-4334	93	$179	12.5	14.5	12.6	11.4	14.7	5.9	71.5	2 / D VL	ET4000/W32p 4/10/94	619

Methodology Boards were tested at 1024 by 768 resolution at 256 colors and a minimum 70-Hz refresh rate on a 486DX2-66 with 16MB of RAM and 256K of secondary cache. Application scores are the factor by which a board exceeds our baseline system, an unaccelerated ET4000-based VGA adapter on a 386DX-25 with 16MB of RAM. The overall value score balances performance, estimated street price, and features. The overall WITS score is the aggregate of the application scores. For all scores, higher is better.

[1] D = DRAM, V = VRAM.
[2] Comparable value offered by other bus versions tested.
For more information about all products in this table, circle reader service no. 902.

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			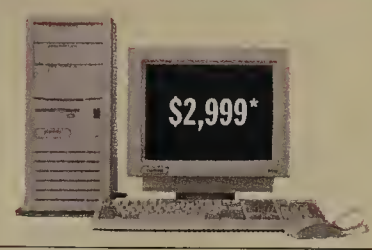
Processor	486DX2/66	Pentium 75MHz	Pentium 75MHz
Processor Upgradable	Yes	Yes	Yes
Std./Max. Memory	8MB/136MB	8MB/192MB	16MB/192MB
Hard Drive	420MB	420MB	720MB
Cache Internal	8KB	16KB	16KB
Cache External	256KB (optional)	256KB	256KB
Local Bus Graphics	PCI	PCI	PCI
Video Memory/Max.	1MB/2MB	1MB/2MB	2MB/4MB
Compaq SVGA Color Monitor	Yes	Yes	Yes
Diskette Drive	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB
Expansion Slots (Total)	3	4	5
Drive Bays (Total)	3	4	5
Ports: Serial/Parallel	1/1 (ECP)	1/1 (ECP)	1/1 (ECP)
Security Features	Yes	Yes	Yes
101-Key Keyboard, Mouse	Yes	Yes	Yes
Software Preinstalled	MS-DOS® 6, MS-Windows® 3.1	MS-DOS 6, MS-Windows 3.1	MS-DOS 6, MS-Windows 3.1
Energy Star Compliant	Yes	Yes	Yes
Warranty†	3-Year	3-Year	3-Year

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CD-ROMs What's Hot, What's Not

EDITED BY MICHAEL S. LASKY

The multimedia floodgates have opened, and the resulting torrent of CD-ROM titles makes the buyer's choice all the more difficult. As *PC World* editors waded through hundreds of CD-ROMs to evaluate a cross section of what's out there, it became clear that the latest crop of discs thrives on high-end video and audio and the fastest CD-ROM drive you can get. Many titles are now optimized for Pentium machines; they'll still work with slower processors, but performance tends to drag. Worth noting in this roundup are two exceptional entries that work fine without a Pentium: A Passion for Art matches superlative content with smooth software engineering, and Xplora 1 Peter Gabriel's Secret World sets new standards for design, performance, and content.

Arts and Culture

Rock 'N' Roll Your Own

Learn how to be a record producer and give your sound board an intensive workout at the same time. Rock 'N' Roll Your Own lets you play along with and mix versions of eight songs, each representing a distinct musical style (rap, rhythm and blues, jazz, pop, and so on). Each song comprises separate WAV file snippets that you can link in any order you choose. Your keyboard is the mixing board that lets you soup up your "recording" with vocal riffs, guitar licks, and percussion and synthesizer effects. When you play back your personalized mix, an MTV-style video plays as well. Although you can record your own vocals and instruments, Rock 'N' Roll Your Own doesn't come close to doing what a professional recording studio can do, but it does have a killer version of "Werewolves of London." *Ah-OOOO, werewolves of London, ah-OOOO...* Compton's New Media; $39.95; 800/284-2045. —*Chris Barr*

Reader service no. 700

100 Japanese Photographers, 1993

Toshiya Watanabe and Akira Matsuo are now my favorite photographers, but I'll bet you've never heard of them. I hadn't either until I came across their work in this elegant photo gallery. This armchair resource of 100 Japanese photographers includes more than 900 images, with not a single cliché snapshot of giggling geisha girls or cheeky sumo wrestlers. Your computer monitor becomes a virtual light box for viewing a stunning, boldly original group portfolio of slides. Click on an image to transport yourself to a viewing gallery with a slide show of 10 to 12 images (accompanied by music) from a specific photographer. What a neat and simple introduction to great photos. Synergy Interactive; $59; 800/734-9466. —*John Goddard*

Reader service no. 701

THIS STRIKING IMAGE by Bruno is one of the many photos on 100 Japanese Photographers, 1993.

One Tribe

Calling all desktop travelers! Now you can circumnavigate the globe and explore world cultures the easy way: through photos, videos, maps, and music. The captivating photos in Virgin Sound and Vision's One Tribe show the customs, architecture, and landscape of over 200 countries. Short, narrated videos provide in-depth information on eclectic topics such as nomadic tribes, pirates, volcanoes, and icebergs. Throughout this colorful journey, you'll pick up numerous tidbits about different countries. For example, did you know that Malta is the most densely populated country on earth, with 3000 people per square mile? Unfortunately, navigating One Tribe can be confusing; I found myself constantly clicking the help button to find my way around. The sheer force of the well-presented content, however, makes this trip worthwhile. Virgin Sound and Vision; $69.99; 310/246-4666. —*Anita Hamilton*

Reader service no. 702

Bob Dylan: Highway 61 Interactive

After 30 years, the voice and music of troubadour Bob Dylan still resonate in the American consciousness. Now, after hundreds of songs and records, his entire artistic career barrels down Highway 61 Interactive like a souped-up Chevy ready for a back-roads trip through the decades. And while there's much to see and hear along the way—performance videos, rare audio outtakes, photo albums, every album cover, lyrics to *every* song, and interviews with his many collaborators—finding all these goodies isn't road-map simple. Instead, the producers decided to hide all these elements within various "environments," such as Greenwich Village, a circa-1961 coffee house, and a supper club that requires five different "environment" visits before you earn an entry ticket to see a rare Dylan performance video. There is also one controversial audio CD music track that features a long-lost version of *The House of the Rising Sun*; some music aficionados claim that it's a combination of different versions of the song that the producers blended together. So Content, 10; Organization, 3. Why did they do it this way? The answer, my friend, is blowin' in the wind. Graphix Zone; $59.95; 714/833-3838. —*Michael S. Lasky*

TROUBADOUR IN TROUBLE: Follow Dylan's work—and life—on Bob Dylan: Highway 61 Interactive.

Reader service no. 703

American Journey 1896–1945

Assembling this montage of U.S. history was "like rummaging through a grandmother's attic," say the liner notes. That's a good analogy—you'll find lots of quirky artifacts, but not enough clues to really understand them. While it's entertaining to watch the *Hindenburg* blow up or to hear General Douglas MacArthur's farewell speech, the explanatory text is surprisingly short and sloppy. I also found minor technical glitches (such as videos that don't run right the first time) and historical errors

(President McKinley was reelected in 1900, not 1901). No doubt, you'll enjoy browsing through these clips, but you may prefer to supplement them with books or videos that provide historical context. Ibis Communications; $59.95; 410/290-9082. —*Eric Bender*

Reader service no. 704

Mega Movie Guide 3.0

Here's yet another not-so-serious reference for movie buffs, stuffed with thousands of films clips, reviews, and artist biographies. But Mega Movie Guide appears to have been created by people who know nothing about software and precious little about movies. To start with, the user interface is appalling, with tiny, headache-inducing, green-on-black text; confusing option buttons; and hypertext that doesn't take you where you want to go. And where are the bios for such important figures as Henry Fonda, D. W. Griffith, and Samuel Goldwyn? Omissions are serious, but outright errors are grounds for dismissal, and the whole thing is riddled with errors: According to this disc, *Casablanca* is in color and *The Fugitive* won the Academy Award for Best Picture of 1993. You're better off spending your money on popcorn. InfoBusiness; $49.95; 801/657-5300. —*Lincoln Spector*

Reader service no. 705

The Ultimate Frank Lloyd Wright: America's Architect

Architecture aficionados can't go wrong exploring The Ultimate Frank Lloyd Wright—a bounty of photographs, video clips, and informative text about the dean of modern American architecture. Delve into "Life & Times," a biographical sketch; "Wright Works," a chronology of his structures; a compendium of trademark motifs in "Structural Elements"; a chance to play architect (roughly) in "Modeling Wright"; animated "Walking Tours" of three of his landmark buildings; and, in the "Library," extensive abridged text of eight authoritative works on Wright. The interface emulates a famous Wright stained-glass window, with each pane representing a different aspect of his life and art. Wright would appreciate this "open plan" for jumping to related topics. You will, too. Microsoft Corp.; $59; 800/426-9400. —*Melissa Riofrio*

Reader service no. 707

No G-Strings

VIRTUAL GUITAR

This violet hunk of plastic from Ahead, Incorporated, looks and feels like an electric guitar, but it's air guitar—pure and simple. You're just hammering out the rhythms, not gnarly chords or notes. The "guitar" attaches to the serial or game port of your sound card–equipped PC and controls your moves in a bundled CD-ROM game. As a music video plays, you strum along on the guitar's five taut strings to match the rhythm of the rock band's lead guitarist. The better you are, the more points you get in a plot-driven climb from garage band member to stadium superstar. What lip-syncing is to the voice, the $99.95 Virtual Guitar is to your fingers—as well as your attitude. And by the way, turn it up loud! Ahead, Inc., 800/872-7827. —*Dean Andrews* **Reader service no. 708**

The Multimedia Cartoon Studio

If you make the mistake of buying The Multimedia Cartoon Studio, you'll get a moderate-size collection of mediocre, single-panel cartoons taken from The Cartoon Bank, a few witless video clips, a nearly function-free calendar program, and some animated screen savers that are less entertaining than a blank monitor. To help get your own creative juices stopped up, there's a cartoon-making kit and a drawing tutorial that is only slightly more interactive than a pet rock. Oh, yes—on the off chance that you like one of the cartoons, you can use it to decorate your stationery. Did I mention the music? Well, it's probably better that I don't. Byron Preiss Multimedia; $59.95; 800/482-3766. —*L. S.*

Reader service no. 706

MORE THAN 300 brilliantly rendered Impressionist canvases are on display in A Passion for Art.

A Passion for Art

Would you believe that one of the greatest collections of Impressionist and Postimpressionist art is found not in a museum in Paris, London, or New York, but in the private collection of the Barnes Foundation in Merion, Pennsylvania? Unlike stuffy museums, this CD-ROM brings art to life with music, insightful guided tours, and stories of the foundation's early years. Beautifully rendered photographs of more than 300 works by Cézanne, Matisse,

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So many CD-ROMs, so little time. Mountain Network Solutions offers an all-in-one drive that handles seven silver platters at once. Its $599 CD7 Minichanger is a double-speed CD-ROM drive jukebox that shuffles multiple discs at the push of a button. Half-second switching between CDs is a no-brainer: Use the bundled Windows app or press one of the seven buttons on the front panel of this external peripheral. If you already have a SCSI-2 card (none is included), the CD7 installs in minutes, creating virtual drive letters for each of the seven trays sitting behind its single drive door. You change discs simply by pressing the drive button. The 4-pound CD7 drive is manufactured by Nakamichi, Mountain's Japanese parent company. 800/458-0300. —*M. S. L.*

Reader service no. 709

Picasso, Renoir, and others are accompanied by descriptive essays, artist biographies, and portfolios of each artist's work. You can zoom in on individual paintings to view details, scroll through thumbnail images in the index, or refer to an illustrated time line. You can even create your own slide show. This compelling presentation makes A Passion for Art a treasure to behold, and its intelligent and tasteful design makes it one of the best art discs ever. Corbis Publishing; $49.95 (street price); 206/562-6000. —*A. H.*

Reader service no. 710

Xplora 1 Peter Gabriel's Secret World

Xplora 1 is that rare combination of intelligent, compelling content and excellent multimedia technology. What could easily have been another rock star's vanity trip is instead a fascinating journey into the artist's world, loaded with unusual as well as expected elements. Of course, you get to listen to songs from Gabriel's many albums and watch the mesmerizing, award-winning videos. But you also get to remix a hit single and learn about Amnesty International, WOMAD (a world music-art-dance event Gabriel started), and his other personal causes. Try your hand at playing instruments from around the world, and learn about the musicians who play them on Gabriel's recordings. All of this is wrapped up in an intriguing, gamelike interface that ensnares you in Gabriel's secret world. Interplay Productions; $59; 800/969-4263. —*M. S. L.*

Reader service no. 711

ROCK VIDEOS, LYRICS, and backstage tours are just part of Peter Gabriel's Secret World in Xplora 1.

Games and Leisure

Blown Away

The movie *Blown Away*, starring Jeff Bridges, may have been a box office bomb, but this CD-ROM game developed by Imagination Pilots is explosive entertainment. You're the Boston Police Department's hotshot bomb expert, and your mission is to defuse a deadly collection of incendiary devices planted by wacko terrorist bomber Justus. If you fail to solve one of the myriad games, puzzles, and riddles, you go BOOM! At every turn, the evil Justus pops up to taunt you—and to provide clues. (Why are lunatics in movies always so helpful?) What separates this disc from similar fare is the high quality of its interactively triggered video clips: Crisp, full-screen video makes the greasy-haired, pockmarked Justus appear even more creepy as he threatens to harm your daughter. Ah, well, just another day at the office. IVI Publishing; $59.95; 612/996-6390. —*Jeff Bertolucci*

Reader service no. 715

Trouble Is My Business, The Raymond Chandler Library

Trouble Is My Business starts with a bang—literally. The title's opening animation begins with a gunshot and ends with a bottle of hooch sloshing in Philip Marlowe's desk drawer. This stylish collection of Raymond Chandler's fiction uses Marlowe's office as an alleyway into the private eye's world. Filing cabinets hold the full text of Chandler's eight Marlowe novels and story collections. You can click on a wall map to view forties-era Los Angeles or tap the clock to display a skeletal time line of the author's life and work. A camera on the desk is loaded with film noir video clips—most, alas, from obscure B movies, with nothing connecting them to Chandler's work besides their mood. And there's little real information about the author himself. The biggest problem is technical: The Trouble disc caused me nothing but. Its style over substance also does it in. Byron Preiss Multimedia; $49.95; 800/482-3766. —*Daniel Tynan*

Reader service no. 713

Gadget

Part slide show, part animation, part novel, Gadget is a new way to tell a story. This is not a game to win or lose but rather a tale in which a sinister narrative pulls you along. I couldn't turn Gadget off until I reached the end, but as I pulled away from my PC I felt disquieted by the disc's ominous vision of a world I would rather not revisit. In Gadget, your movements are limited to those that further the plot: You have to collect five objects to save the world from a supposedly impending collision with a comet. Or the dire reports could just be a ruse to destabilize the government, and the five gadgets simply agents of its destruction. The stunning Myst-style graphics evoke a hybrid of 1930s Fascist art and 1990s technology. A foreboding sound track underscores the urgent pace of this compelling game. Synergy Interactive; $59; 800/734-9466. —*Russell Glitman*

Reader service no. 714

A SINISTER BELLHOP, mysteriously furnished rooms, and a distinctly film noir atmosphere fill Gadget.

Mountain Biking

Hey, dude! Are you a honed-to-the-bone, expert mountain bike rider? Not yet? Well here's *your* CD. Mountain Biking expertly steers you through the mountain bike experience, from "active bump swallowing" and "chain suck prevention" to the more mundane turning, pedaling, and log hopping. The techniques are effectively illustrated with skeleton-on-a-bike animations and videos of moves you currently only dream about. An introductory section dispenses good advice on mental and physical preparation for those of us who've been "using our bodies for a few years." While mountain biking may be an acquired taste, this disc is one of the best introductions to get you on the wheels. Media Mosaic; $59.95; 800/972-3766. —*Kirk Steers*

Reader service no. 712

The Incredible toon Machine

This disc could be called "Rube Goldberg Meets Walt Disney." Like other titles in Sierra Online's Incredible Machine line, The Incredible toon Machine helps you create hilariously complex contraptions to accomplish simple tasks—a sort of object-oriented lunacy. An anvil falling on a cat, say, might eventually release a balloon into the sky. The disc's inventiveness is due to its richly animated creations. Pull the revolver's trigger, and it spits hot lead. Tempt Sid Mouse to run through the tunnel, and he'll stop to put on a miner's hat first. Al E. Cat screams and claws when he falls but stops to pull a table out of his lunch box when the whistle blows. This imaginative program will spark your own imagination. Sierra Online; $39.95; 800/757-7707. —*L. S.*

Reader service no. 716

Unnecessary Roughness '95

The 1994 football season may be a memory, but Accolade's Unnecessary Roughness '95 lets you enjoy your own season now. This cool simulation comes with rosters of every NFL franchise, so you can pit your favorite team against bitter rivals. The disc is packed with player profiles and stats, and you can trade players and create new plays as you transform your franchise into a Super Bowl contender. If you seek the thrill of a 60-yard bomb or a drive-killing sack, you'll love the realistic action that lets you guide your star players to big plays. You can coach your team or let the PC do the work. Al Michaels of *Monday Night Football* provides play-by-play commentary, while an instant-replay feature lets you view plays from any angle at various speeds. But you won't get to argue any of the refs' calls. Accolade; $60; 800/245-7744. —*Michael Desmond*

Reader service no. 718

Speakers of the House

YST-SS1010 SPEAKERS

Thump. Thump. Thump. The disco beat of Gloria Estefan blasts from my office PC. The driving 4/4 beat reverberates through the *PC World* offices. Finally, multimedia sound rivals that produced by home stereo systems, as speaker manufacturers offer magnetically shielded computer versions of the high-end home audio products. My favorite is the $349 Yamaha YST-SS1010, for its combination of good looks and good sound. The set combines two desktop-size YST-M10 speakers ($149 a pair) with a floor-based subwoofer box. The result is a more rounded sound. Yamaha Corp. of America, 714/522-9240. —*M. S. L.* **Reader service no. 717**

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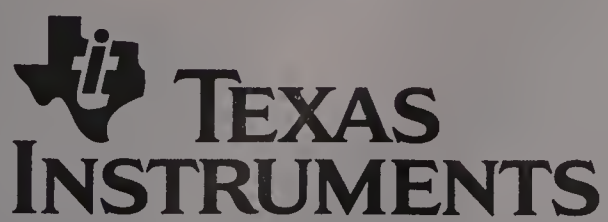

August 1994
TM4000M/25

July 1994

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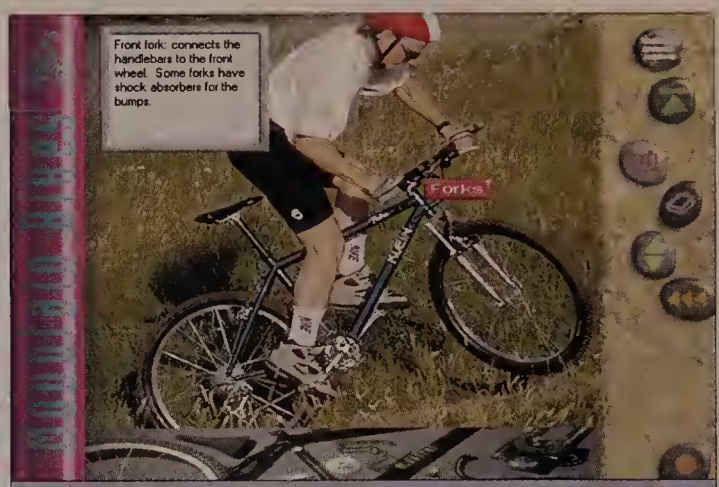
Circle 220 on reader service card

The Vortex: Quantum Gate II

When last we saw our illustrious hero, Drew Griffin, in Quantum Gate I, he was trying to save the earth from environmental Armageddon by battling vicious, human-size bugs on the remote planet AJ3905. Now, in Quantum Gate II, Drew finds out those weren't icky old bugs after all, but New Age–y humanoids with wings. Still with me? If so, you're going to love HyperBole Studios' latest "virtual cinema" production—a cross between a game and a movie in which you play the lead role. Quantum Gate II boasts the same intuitive interface, high production values, and surprisingly respectable acting of its predecessor, plus a nifty score by techno-percussion ensemble D'Cuckoo. Unfortunately, it also shares its predecessor's glitchy installation—I spent hours reconfiguring my sound and graphics drivers, and even then I had intermittent problems with screens full of gibberish and out-of-sync sound. But, hey, that's multimedia for ya! HyperBole Studios; $45; 800/693-3253. —*Dan Miller*

Reader service no. 719



MOUNTAIN BIKING is more than a how-to disc—you also get info on bike construction and bikers' lingo.

Doom II: Hell on Earth

I'm doomed all right. It was 3 a.m. when I realized I had a slight problem. I had been playing the sequel to the original Doom for almost 6 hours, rushing through dark halls filled with demonic horrors and laying waste to a host of monstrous evil. I wanted to quit, lay down my double-barrel supershotgun, and get some shut-eye. But with each passing level I became more Rambo-like. Fire-spouting imps gave way to plasma-shooting brain spiders; still, I pushed on with a dizzying array of weaponry. At night, the 3-D–rendered realism became spooky—the fluid sense of motion enhanced the haunting music and the thunderous blast of shotguns. Doom II is a terrific, savage, bloodthirsty romp, but it's not a game for the weak of stomach or the easily addicted. For all others, fire away! GT Interactive; $59; 800/362-9400. —*M. D.*

Reader service no. 720

All Keyed Up

MUSICSTAR

My parents made me take years of piano lessons, and to this day I wince at the memory of all those off-key scales, arduous finger exercises, and futile attempts to play Chopin's "Minute Waltz" in under 10 minutes. If only Reveal Computer Products' $99 (street price) MusicStar had been around back then, my fingers might be waltzing in 60 seconds today. It comes with a 37-key MIDI keyboard that plugs into any sound card; a tutorial that transcends traditional finger exercises; and a recording module that lets you create music or play along, karaoke-style, with prerecorded songs. You not only hear what you play, but you see the results on screen, with follow-the-note notation. Even if you don't learn the piano, you'll have fun. 800/738-3251. —*M. S. L.* **Reader service no. 721**

Reference and How-To

Complete World Bartender Guide

My whiz-bang multimedia PC can't make a good martini. And with the help of the Complete World Bartender Guide—it still can't. There's no dearth of information on this disc, mind you, filled as it is with recipes for more popular and obscure drinks than I'll ever make. It also includes a wine guide; nonalcoholic drink recipes; hypertext links to a short list of quaffing terms; and stuttering, grainy video clips ranging from Mothers Against Drunk Driving commercials to the history of vermouth. The racier drink mixes, however, are conspicuously absent (even the infamous Kamikaze is missing), and despite pictures of which glass to use for each drink, the disc gives no clue what the finished beverage should look like. The Guide is an interesting novelty, but it improves little on the dog-eared, behind-the-bar version. You'll probably find yourself using this CD-ROM for a coaster someday. Media Solutions Int'l; $29.95; 800/709-7773. —*Rick Overton*

Reader service no. 730

The Internet for Everybody

The Internet beckons, and this egalitarianly titled primer sounds like an easy entrée to the info highway. Not so. There are many ways to get connected, but The Internet for Everybody, alas, covers only *one* of them—a dial-up UNIX shell account. With the major online services offer-

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Astounding Sound

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Getting 3-D sound from only two speakers seems like an impossible feat. But the Vivid 3D Pro from NuReality does just that from both mono and stereo sources. Incorporating the patented SRS (Sound Retrieval System) technology, the $149.95 Pro transforms previously flat sounds into enhanced, surround-sound audio. The futuristic-looking, 8-inch-high device connects your sound source—an 8-bit or a 16-bit sound card, or even a stereo component—to your speakers. A "space" switch lets you adjust the localization and movement of sound, while a "center" switch augments the predominant sound, such as a lead vocal or a solo instrument. The Pro doesn't keep you deskbound, either: You can experience the device's full, ear-fooling 3-D effect from anywhere in the room. 800/501-8086. —*M. S. L.*

Reader service no. 724

ing Net services, easier PPP and SLIP access, and Mosaic-like graphical Internet tools, a UNIX shell is probably the *last* way a Net newbie would choose to get wired. And the focus on UNIX shells means you'll learn nothing about Windows apps for SLIP and PPP. If you're an academic or a government worker with a UNIX account, this CD may be worthwhile; otherwise, don't bother. Emerging Technology Applications/Point Productions; $49.95; 800/285-3821. —*D. M.*

Reader service no. 723

THE VORTEX is a virtual movie that plays new scenes based on your previous choices—sort of like life.

American Sign Language Dictionary

Want to learn the third most commonly used language in the world today? Then let your fingers do the talking with Martin Sternberg's American Sign Language Dictionary. This disc is more than just a dictionary—it's a fascinating history of the silent language and an effective how-to tool. Using video clips, illustrations, and games, it teaches you how to sign and finger-spell. The CD-ROM also includes resource guides containing information on assistance organizations and product sources for the deaf and hard-of-hearing. Ironically, what helps make learning sign language easy here is the disc's excellent sound. HarperCollins Interactive; $69.95, with book $79.95; 800/424-6234. —*D. A.*

Reader service no. 722

A MULTIMEDIA SIGN LANGUAGE TUTORIAL is just one part of the American Sign Language Dictionary.

The Motion Picture Guide

This single silver platter takes the place of a 20-volume, for-libraries-only reference set. It's an incredible trivia orgy for cinemaniacs that lists more than 35,000 films—in fact, every feature film released theatrically since 1927. A slick and swift search feature lets you find a movie by name or by just about any of its contributors. Who did the choreography for the 1954 MGM musical epic *Athena*? Within seconds I find out it's Valerie Bettis. A click on her name takes me to a screen with every other film she worked on. Ditto for cast members, writers, cinematographers, composers—you name it. Think of this as a massive textual database version of the credits that roll at the end of every film. In addition, The Motion Picture Guide gives you reviews, plot synopses, award stats, MPAA ratings, and other ancillary information for each film. CineBooks; $199; 800/246-3776. —*M. S. L.*

Reader service no. 725

The Multimedia Typing Instructor

I nevEr did taKe a typ/ing class in high schoOl, and boy, dOes iT sHow! But with The Multimedia Typing Instructor, there's hope for me and other keyboard klutzes yet. Using an airport terminal as your launchpad, you go on typing adventures to exotic places such as Stonehenge and Ayers Rock. As you type, an on-screen keyboard lights up to show you which key you should press next, an aid that keeps your eyes focused on the screen instead of on your hands. The Virtual Adventures

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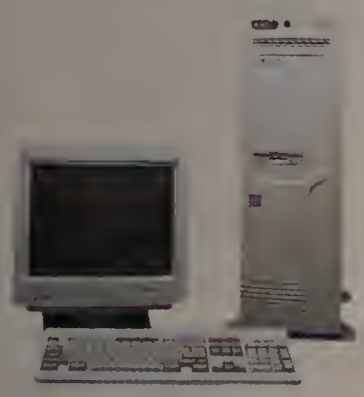

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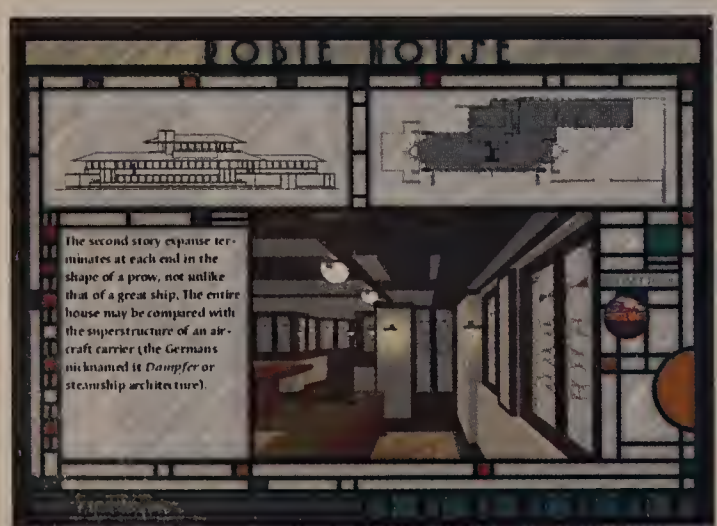
gallery turns learning into diverting, arcade-style games. In Sea Adventure, for example, you have to type fast or else you'll be eaten by an underwater creature. Video clips demonstrate the proper positioning of your hands and body while typing, and the disc includes a set of exercises that can help reduce the risk of repetitive-strain injuries. Progress reports show you how you're doing. My typing is much better now, thank yOu. Individual Software Inc.; $29.95; 800/822-3522. —*Cathy Kenny*

Reader service no. 729

Dr. Ruth's Encyclopedia of Sex

Curious about sex? Dr. Ruth's Encyclopedia of Sex is packed with information for the inquisitive expert and novice alike. Photographs, videos, and hypertext links to related subjects spice up detailed discussions on more than 200 topics. You can also listen to excerpts from Dr. Ruth's radio show, read answers to commonly asked questions, and look up more than 400 words (including slang). This comprehensive CD-ROM does a bang-up job of mixing modern sexual concerns—such as AIDS and masturbation—with clear, forthright medical discussions and offbeat historical information. And listening to Dr. Ruth's chirpy tone makes this potentially academic exercise an engaging experience. Many sections, including the anatomy diagrams, are appropriate for teaching children about sexuality, but parents may find other areas too explicit. Creative Multimedia; $29.99 (street price); 800/262-7668. —*A. H.*

Reader service no. 726



THE ULTIMATE FRANK LLOYD WRIGHT explores the how and why of building design in minute detail.

The Joy of Sex

As the ultimate how-to book, Alex Comfort's *The Joy of Sex* is an ideal candidate for multimedia. Unfortunately, the CD-ROM version doesn't rise to the occasion. Where the book is frank and detailed, the disc is priggish and vague. For example, the videos consist of lectures from annoying therapist types or jumpy R-rated interludes set to syrupy flute music, sometimes accompanied by unintentionally hilarious voice-overs (like "I love slowly stroking the shocking fuzz of your electric fur"). And when The Joy of Sex does get down to the nitty-gritty details, it relies on artistic sketches. You click on buttons next to each drawing to hear a discussion from male, female, or "expert" perspectives. Unfortunately, these points of view are nearly identical, and aside from some quaint descriptions for different positions ("wild geese flying on their backs"), the program is long on generalities and short on specifics. The upshot? The Joy of Sex CD-ROM is more like fore*work* than foreplay. Philips Media; $59.99; 800/340-7888. —*D. T.*

Reader service no. 727

A Tight Fit

TEAC SUPERQUAD 4X COMBO

My PC's drive bays are already filled, and I want to add an internal CD-ROM. A problem? Not if I swap in a Teac SuperQuad 4X Combo drive from Teac America. In the same bay that once held a single floppy drive, I can squeeze a quad-speed CD-ROM drive as well as a 3½-inch floppy drive—perfect for those of us who have maxed out our drive bays. The $599 kit includes an AT CD-ROM interface board, floppy drive accessories, cables and mounting hardware, and a utility for listening to audio CDs. Installation does involve removing your computer's cover and fiddling around with some connectors, but the manual and software help to lessen any configuration anxiety. 800/888-4923. —*M. S. L.* **Reader service no. 728**

For more information about all products in this report, circle reader service no. 911.

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Here's How

Spreadsheets 266 | Word Processing 270

HELP LINE Q&A

Tip of the Month

WINDOWS PRINTER DRIVERS TO GO: If you're a notebook-toting Windows user, someday you'll need to print. Prepare for those unexpected printers you may encounter when you're on the road: In addition to taking drivers for your own printer, carry some spare printer drivers, installed and ready to go.

You can install a driver by opening Control Panel and double-clicking the Printer icon. In the Printers dialog box, click Add. For each driver you want to install, double-click the printer name in the List of Printers box and insert the Windows setup disk that Windows requests.

In addition to the drivers you anticipate needing, be sure to install the ones for Generic/Text only, Apple LaserWriter, Epson FX-1050, HP DeskJet, HP LaserJet Series II, HP LaserJet III, and PostScript Printer. If you expect you'll need to print in color, install the HP DeskJet 500 Printer Series Driver as well (to support the DeskJet 500C, 550C, and 560C color ink jet printers). You can find it as d5w3us.exe on CompuServe in Hewlett-Packard's Peripherals Forum (go hpper) and as d5wn31.exe on America Online in the PC Software Center (keyword: software).

Shane Rau, Technical Editor

Move Over, Little Drive...

Q I just supplemented my 170MB IDE hard disk with a new 730MB IDE drive. How can I partition it most efficiently? Also, shouldn't I make part of it my new drive C:, since it's faster than my current hard drive? If so, what's the easiest way to transfer the contents of my current drive C: to the new one without backing up first?
KRB180, PC World Online

A Yes, you do want your new hard drive to be C:, but not backing up is asking for trouble. In general, larger hard drive partitions require DOS to dole out disk space in larger pieces, called allocation units or clusters. For partitions less than 128MB, cluster size is 2K. Between 128MB and 256MB, clusters are 4K, which means that even if dir or File Manager tells you a file is only 1K in size, it's actually using 4K of real estate. Between 256MB and 512MB, clusters grow to 8K. At this point, a relatively full partition is probably wasting several megabytes of space with partially used clusters. Exceed 512MB, and clusters swell to 16K. If you can live with the inconvenience, I'd recommend splitting the drive into three partitions, each no larger than 256MB—say 250, 250, and 230.

Transferring the contents of your old hard disk is a snap, if both drives get along. IDE drives operate in either master or slave mode. When you install the new drive, you'll probably have to change a jumper on the old one to make it the slave. If both drives come from the same manufacturer, you're virtually assured they'll cooperate, and as soon as you create, activate, and format the new drive's partition, you can copy everything on the old drive to the new one in minutes using **xcopy d:\ c:\ /s**. However, IDE drives from different manufacturers often won't work together as master and slave. You might try reversing their roles, or contacting one or both manufacturers for a solution. If the two refuse to speak, you'll be glad you made a complete backup of your old drive first.

New DOS Version Is No Fun

Q I recently upgraded to a new computer and moved from DOS 5.0 to DOS 6.22 at the same time. Unfortunately, I have a game that refuses to run and tells me it requires DOS 5.0. How can I work around this?
Josh Alvies, PC World Online

A Many programs check to see what version of DOS is running before they load, usually because they require a feature available only in a particular DOS version or versions. New DOS versions don't appear in your program's approved list. Fortunately, DOS's Setver utility lets you fool programs into thinking a different DOS version is running. It works by intercepting a program's request to DOS for the version number, and supplying the program whatever lie you want it to tell.

To make your game run under DOS 6.22, you need to first issue the command **setver** *filename.ext* **5.00** at the DOS prompt, where *filename.ext* is your game's executable file name and ex-

PETER HOEY

tension. This adds an entry to the Setver program's internal table, which Setver can reference for the game's version number. (If you want to see the current contents of the table, enter **setver** at the DOS prompt.)

Next, you have to load the new table into memory: Make sure config.sys contains the line **device=c:\dos\setver.exe**, then reboot your PC. Now your game should run without a hitch.

Slimmed-Down CD-ROM Storage

Q I've amassed quite a few CD-ROM discs and find their jewel cases bulky. To save space, I'd like to store discs in 5¼-inch floppy disk sleeves. Is there a safe way to label the loose CD-ROMs with an ID number?
Jerry Ramesbottom, CompuServe

A Go ahead. In fact, CD-ROM storage wallets, which you can find in computer catalogs and record stores, let you do the same thing. But why pay good money for those when you have so many perfectly good 5¼-inch floppy disk sleeves lying around? The key thing is to prevent scratches to the CD-ROM's underside, which you can pretty much ensure by removing the disc from the drive or caddy and returning it immediately to the sleeve. As for labeling CD-ROMs, I'd recommend writing directly on the top surface with a felt pen or laundry marker. The worrywart in me says don't put a paper label on the disc. Labels don't damage discs or pose a direct threat to the CD-ROM drive, but they do add weight to one side of the disc, which could *theoretically* wear out your drive's bearings faster. Your drive will probably become obsolete first, but label me cautious.

Is TIA Pulling a Fast One?

Q My interest was piqued by the item ["World Wide Web by WELL?"] in February's column about Cyberspace Development's The Internet Adapter (TIA), a utility that tricks a UNIX host into providing a serial line Internet protocol (SLIP) connection.

My shell provider says TIA is a major drain on system resources, and has prohibited the use of TIA unless the user is paying for a SLIP account.

Shouldn't you mention that using TIA may violate the rules of local providers? Furthermore, does Cyberspace Development warn prospective software buyers about this problem?
Larry Sherman, New York

A A spokesperson from Cyberspace Development told me the company is aware of only four or five Internet service providers (ISPs) worldwide that specifically prohibit the use of TIA on their hosts. If you've acquired a copy, only to discover afterward that your ISP considers it a no-no, Cyberspace will refund your money with no questions asked, or it will let you transfer your TIA license to another provider.

The Cyberspace representative admits using TIA can put a heavier load on the host than using a UNIX shell account. The problem arises chiefly in the case of graphical Web browsers like Netscape and Mosaic. Users retrieve many more graphic images with these than they would with text-based Internet tools. But there's nothing unethical about using TIA, as long as your ISP doesn't prohibit its use. TIA doesn't do anything bad to the host system, nor does it steal from the ISP. TIA does compete with the ISP's attempts to sell you a more expensive SLIP or point-to-point protocol (PPP) account. TIA isn't equivalent to SLIP or PPP, though—it doesn't provide you with a unique IP address (it borrows the host's), so you can't use it with every Internet program and service.

Sleuthing for File Origins

Q I recently picked up a shareware program, Spacemaker for Windows, that has been a great help in finding duplicate files on my hard drive. I've

USER GROUP OF THE MONTH

MicroLink PC Users Group

The June user group tips come from the MicroLink PC Users Group of Southern California. The group meets on the first Saturday of each month at the La Habra Community Center, 101 W. La Habra Blvd., La Habra, CA. Special interest group (SIG) meetings start at 3:30 p.m. and the general meeting follows at 6. SIGs include boot camp for the PC, Windows, WordPerfect, BBSs, and modems. A monthly newsletter, *ML News*, features PC industry news, technology articles, product reviews, commentary, and PC tips. Membership ranges from beginners to PC industry engineers and experienced consultants. In addition to educational efforts, MicroLink provides technical support and computer donations to charities in Southern California.

For more information, contact Mark Frankfurth, president, at 14118 E. Whittier Blvd. #112, Whittier, CA 90605, or call the group's hot line at 714/491-6069. Dial the MicroLink BBS at 714/533-4227. MicroLink membership costs $25 a year and includes the newsletter and participation in SIGs.

Reader service no. 761

SCANDISK CUSTOM DISK CARE: If you'd like to use DOS 6.2*x*'s ScanDisk at start-up and customize its behavior, put scandisk /custom on its own line in your autoexec.bat file. Then open scandisk.ini in your DOS directory, and follow the file's instructions to configure ScanDisk.

Mark Frankfurth
MicroLink PC Users Group

deleted at least 10MB of useless files, but there are plenty of others I hesitate to delete, particularly a number with these extensions: .cgm, .dll, .fon, .reg, and .wmf. How can I tell which mystery files I can safely get rid of?
Chuck Leazott, Zephyrhills, Florida

A Windows' uninstall utilities are increasingly popular, for good reason. If you occasionally install, then remove, a Windows application, you'll find your free hard disk space gradually dwindling for no apparent reason. Uninstall utilities are helpful, but not perfect: They're of limited help in removing programs you installed before you decided to use an uninstaller, and they don't get rid of files left behind when you upgrade existing programs. What makes this problem really tough is that just deleting the directories created by the program's installation utility isn't enough; most such utilities place program modules and drivers in the \windows or \windows\system directories as well. Since these files generally have obscure names, figuring out which are superfluous requires a little deductive reasoning. For a step-by-step approach to aggressive housecleaning, see the next item, "Flushing Out Fruitless Files."

For a brief list of some of the most commonly encountered file types, see **FIGURE 1**. As for your mystery files, the .cgm and .wmf extensions denote graphics files—clip art, most likely. The .fon file is a Windows plotter font, and the .reg file is a data file used to configure Windows' registration database (for an explanation of what that is, see "It Just Doesn't Register" in February's *Help Line*). You can probably get rid of all of these without causing havoc. The .dll file is a Dynamic Link Library file—a program module a Windows program or Windows itself loads when necessary. If you can determine that it's part of a program you've deleted, go ahead and delete it too.

If you still can't figure out where a particular file came from, and you don't feel like taking risks, move it to a temporary directory. If some program needs it later, an error will say the program can't find the file; you can then move it back where it belongs. After a few months, if the file hasn't been missed you can delete it from the temporary directory.

Flushing Out Fruitless Files

Windows programs litter your hard disk with files you may never need. You can get rid of most of them if you know what to look for.

1. Deleting files is serious, and you need to back up your system anyway, so do it now. If you accidentally delete a crucial file, you'll be able to restore it.

2. Use any uninstall features that came with your programs; the setup utilities of Windows, Microsoft Office, Novell's Quattro Pro, and other programs offer uninstall options that can save you both hours and megabytes. Let them do the work so you can get back to playing Doom.

3. Move the icons of unwanted programs to a single Program Manager group, select each one in turn, and find where it is located on your hard disk, using *File•Properties*. Switch to File Manager, and delete the file or the entire program directory by highlighting it and pressing **<Delete>**. Don't forget to delete the icons as well—just highlight them and press **<Delete>**.

4. Now that you've pruned out the easy-to-reach deadwood, it's time to look more closely. Using File Manager, scout for entire obsolete directories and delete them. Likely candidates are DOS programs you no longer use and Windows programs whose icons or groups you have removed from Program Manager.

5. Dig even deeper, and scour each remaining directory and subdirectory for obsolete files. (Try looking for big ones first—say, 100K or larger.) For example, if you upgraded from Microsoft Access 1.1 to version 2.0, chances are good that .dll files specific to version 1.1 are left in the \windows\system directory. You can also use File Manager's *File•Search* command to look for and delete a particular kind of file, such as .bmp, .fon, or .ttf files, or files that share the same size, date, and time stamp. Exit Windows before deleting .tmp files, and don't forget to delete unnecessary .zip archives. If you're not sure whether you should delete a file, try renaming it or copying it to a floppy as an interim step.

6. Finally, if you use Windows for Workgroups 3.11, your version of File Manager offers a secret weapon other Windows versions don't. If you're stumped by a particular file, select it and choose *File•Properties*. The resulting dialog box may give you some clues about what program the file belongs to—even what version of the program. (Not all files contain this kind of information.)

By Scott Spanbauer

Scott Spanbauer is a contributing editor for PC World. Help Line *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

Common File Extensions

Programs, drivers, and related files		Sound and video files		Compressed archives		Data and other related files	
386	fmt	avi	mpg	arc	lzh	asc	txt
asm	fon	mid	wav	arj	zip	db	wk1
atm	fot	mov				dbf	wk3
bas	hlp					dic	wk4
bat	inf					doc	wk5
bin	ini	**Graphics files**		**Temporary or backup files**		dot	wp
cbt	ovl					idx	wpm
cfg	pif	bmp	jpg	bak	syd	mdb	wri
com	reg	cdr	pcx	chk	tmp	ndx	xla
cpl	scr	fxr	pm4			rtf	xlm
dll	sys	fxs	pm5			sam	xls
drv	ttf	gif	tif			sty	xlt
exe	vbx	ico					
flt	vxd						

FIGURE 1: WHILE FILES CAN HAVE ANY EXTENSION, popular usage has set common standards to help identify file types.

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16661	Adobe Photoshop 3.0	$569.95
13791	Adobe PageMaker 5.0	579.95
4470	Artisoft LANtastic 6.0 Starter Kit	239.00
17012	Banner Blue Family Tree Maker CD	59.95
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2333	Broderbund Myst	49.95
16440	Central Point XTree Gold–Windows	99.95
20260	C. Labs Discovery Kit-New Edition	299.95
20257	C. Labs S8 Discovery CD 16-4X Kit	419.95
19989	Connectix RAM Doubler - Windows	55.00
7850	Corel Gallery CD-ROM Windows	39.95
2446	Delrina WinFax Pro 4.0	89.95
6421	Grolier Encyclopedia	79.95
9880	HSC Convolver Windows	129.95
3956	HSC KPT Windows	129.95
6733	Inspiration–Windows	129.95
6536	Lotus Ami Pro 3.1 *(w/$30 rebate)*	69.95
9599	Lucas Arts Dark Forces	53.95
5140	Lucas Arts Rebel Assault	49.95
1085	Macromedia FreeHand Windows	399.95
9380	Macromedia Multimedia Studio	1499.95
7834	Microsoft Cinemania	57.95
7618	Microsoft Encarta '95 for Win. CD	87.95
9774	Microsoft Office for Win. 4.2	479.95
7693	Microsoft Win. NT 3.5 Wkstn.	295.95
7811	Microsoft Word for Windows	299.95
8994	Novell Netware 4.1 *(5 user)*	649.00
8240	Novell PerfectOffice 3.0	449.95
7226	Novell Quattro Pro 6.0 for Windows	279.00
8047	ProCD Select Phone	149.95
2006	PROCOMM Plus for Windows 2.11	139.95
3217	Quarterdeck OEMM 7.5	61.95
4402	Soft Pub Harvard Graphics–Win.	279.95
7435	Symantec ACT! 2.0 for Windows	189.95
5136	Symantec Norton Utilities 8.0	124.95
0586	Symantec Norton 8.0 Vers. Upgrade	47.95
1303	Symantec pcANYWHERE 2.0-Win.	129.95
6655	Traveling Software LapLink for Win.	139.95
2914	WordPerfect 6.1 for Windows	279.95

HARDWARE

11105	3COM EtherLink III TP	$109.95
16926	Allied Telesyn 8 Prt 108ASE-T Hub	144.95
19482	Altec Lansing ACS51	79.95
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2775	Asanté 8 Port Hub	189.00
14101	ATI Graphics Xpression 64 2M8	199.95
20670	Canon BJC 70 Color Printer	369.00
17310	Cirque Glide Point	79.95
3226	C. Labs Sound Blaster Pro Value Ed	79.95
16899	Diamond Stealth 64	369.95
16084	Epson Stylus Color Printer	549.00
11396	Hayes ACCURA 144+ Fax	119.95
16889	HP DeskJet 540 Printer	299.00
3578	Intel DX2 OverDrive 50MHz	124.95
16109	Intel EtherExpress PRO/ID TP	99.95
16820	Iomega Bern.230MB Transportable	499.95
19908	Iomega Ditto 420MB Tape Drive	159.95
19171	Iomega Zip Drive–SCSI	199.95
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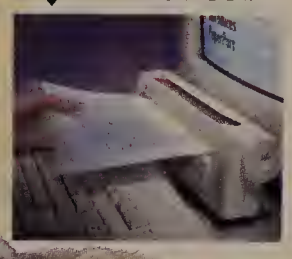

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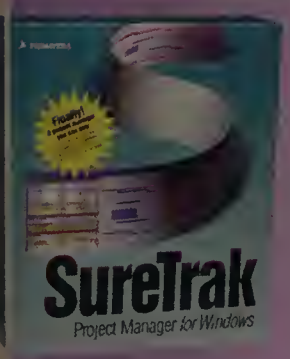

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SPREADSHEETS Q&A

Bisecting a Cell in Any Spreadsheet

Q On occasion, I need to draw a line from corner to corner diagonally in a cell. Is this possible?
Bill Kasler, Palos Verdes, California

A Not only is it possible, it's a snap. In Excel 5.0, begin by displaying the Drawing toolbar: Select *View•Toolbars*, choose *Drawing*, and click *OK*. (Use *Options•Toolbars* in Excel 4.0.) Now click the line tool, hold down the **<Alt>** key, and drag a line from corner to corner in the cell. The <Alt> key forces the line to "snap" to the corners of the cell. By default, such a line will remain attached to the cell corners even when you change the column width or row height. To adjust the line properties in 5.0, first make sure that the line is selected, then right-click the line and select *Format Object* from the pop-up menu. The *Properties* tab displays the settings that control how the line interacts with the worksheet. *Patterns* lets you adjust the line's width and color.

In 4.0, make sure the line is selected, right-click it, and choose *Object Properties* or *Patterns* for the same results.

The same trick works in 1-2-3 for Windows, except that the <Alt> key doesn't snap the line to the corners. To draw the line, select *Tools•Draw•Line* and use a steady mouse hand to fit the line to the cell corners. Quattro Pro 6.0 now sports a drawing layer, but since its lines don't resize when you adjust the cell size, it doesn't work well for this task.

Controlling Spinner Values in Excel 5.0

Q I love the way Excel's form controls let me create custom interfaces for my worksheets. But I've got a problem with the spinners: They yield only integer values, and I need a spinner that uses increments of .5. Is there any way to do this?
David Hager, Baton Rouge, Louisiana

A Yep. Just link your spinner to one cell, then build a formula in another cell that multiplies that value by .5. The model shown in **FIGURE 1** illustrates how you might set it up.

Note that step 5 allows you to cover up the number or font in cell B3, but part of it may still show if it's large enough. One way to avoid this problem, if the worksheet is going to be protected, is to format the cell as Hidden (*Format•Cells•Protection•Hidden•OK*). Or you can set the font color to match the worksheet color (*Format•Cells•Font*, click the drop-down arrow on the right side of the Color box, click the appropriate color in the drop-down palette, and click *OK*). Any combination of these techniques can be used to hide B3's value.

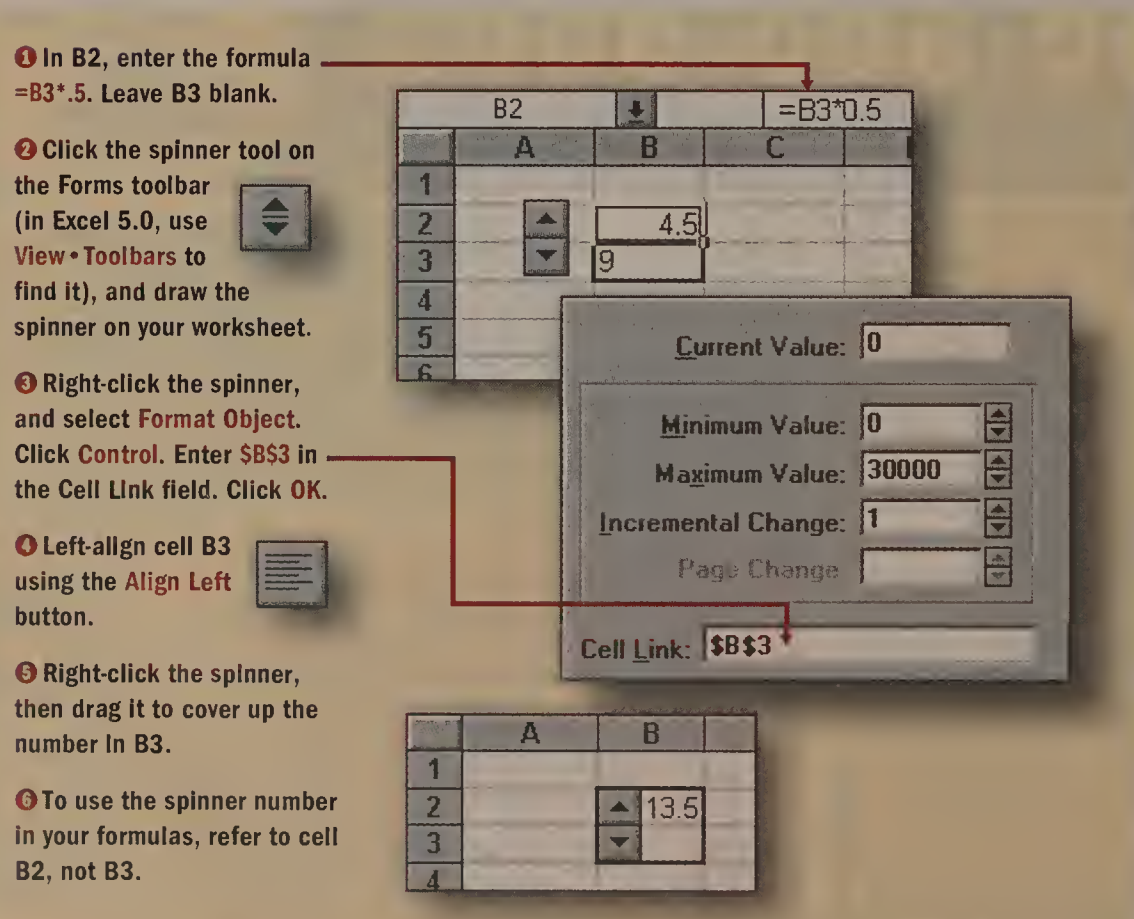

FIGURE 1: CREATE SPINNERS IN EXCEL 5.0 that can be increased or decreased in any increments you choose instead of just in integer values.

Getting Data From Quattro Pro to 1-2-3 or Excel and Back

Q In my office, we use 1-2-3 release 4.0 for Windows; at home, I use Quattro Pro 6.0 for Windows. How can I make 1-2-3 read the worksheets I've created with Quattro Pro?
Paul Pojanowski, Internet

Q I work for a management consulting firm where I help financial analysts at several companies perform forecasts. One of our clients uses Quattro Pro 5.0, another uses Excel 5.0. How can I share worksheets?
Kevin Lynch, Westford, Massachusetts

A Users of Quattro Pro 5.0 and 6.0 have it easy with 1-2-3 release 4.0 and 5.0 worksheets, because Quattro Pro can open those files directly. Otherwise, the best route for multipage worksheets is usually to save them in Lotus's .wk3 format.

When you're ready to save your worksheet, select *File•Save As*. In Excel, click the scroll button beside the Save File as Type list; in 1-2-3, click the button beside the File Type; in Quattro Pro, it's File Types. Choose

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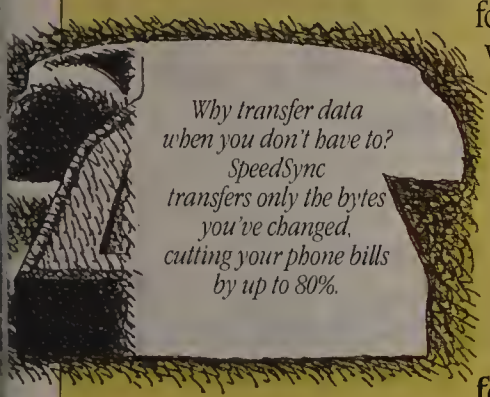

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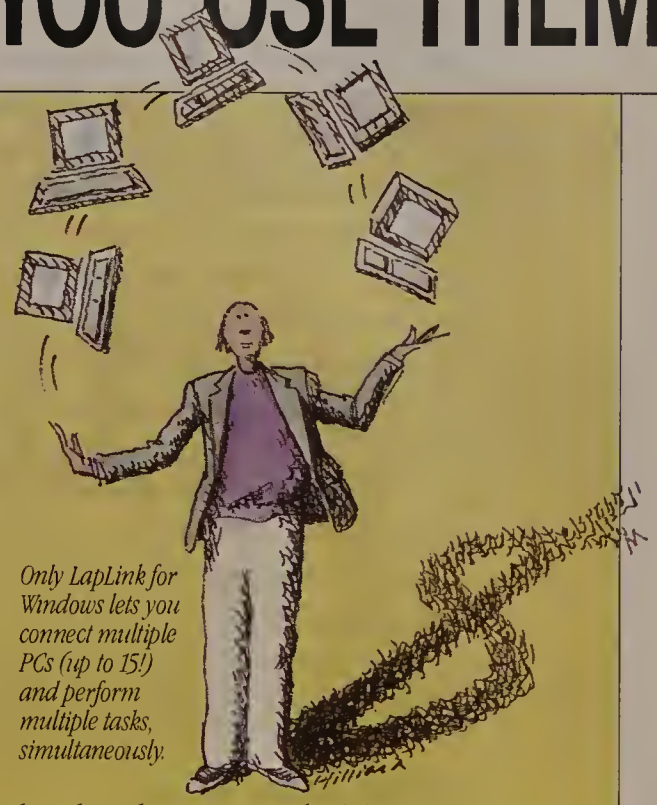

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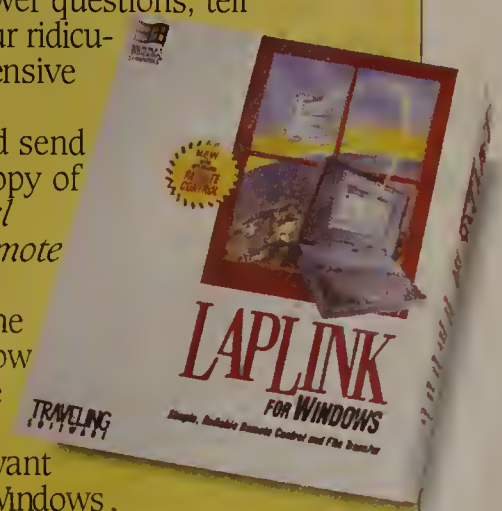

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the *WK3* option, enter a name in the File Name field, and click *OK*. Now you have a file that you can open in all three programs.

The more sophisticated your worksheet, the less compatible the spreadsheets will be. Obviously, if you use advanced features such as 1-2-3's Version Manager or Excel's Pivot Tables, you're not going to get a satisfactory translation, because the .wk3 file format can't handle these features. In addition, graphs sometimes cause problems: If you open a file in 1-2-3 that's supposed to contain a graph and you can't find it, press **<F5>** and select *Chart* in the Type of Item list. You should see your graphs listed. Choose a graph and click *OK* to retrieve it. In Quattro Pro, you'll probably find your graphs on the graph sheet at the back of the workbook. And beware: You'll probably have to re-create your charts if you use the .wk3 format to transfer a worksheet from Excel 5.0 to Quattro Pro.

Unbundling 1-2-3 for Windows Worksheet Pages

Q I have a question that stumped Lotus's support staff. I have a 1-2-3 release 4.0 file that contains one sheet for each of my company's 23 profit and loss (P&L) groups. This arrangement makes it easy to copy formulas, summarize values, change formats, and so on. I would like an easy way to split the file into 23 single-sheet files for distribution. I tried the Lotus conversion program, but it didn't work.
Steve Okinow, New York

A I've put together a macro for you. Beginning with sheet B (named Mercury), it steps through each page and extracts its data into a separate file, using file names you've entered into cell A1 of each P&L sheet.

If you enter just the file names into cell A1 of the 23 sheets, each of your one-page files will be saved in your default directory. Alternatively, you can specify a path and file name in any sheet's cell A1 to save its file to a different directory.

Follow the steps outlined in **FIGURE 2** to set up the model. To execute the macro, press **<Ctrl>-G**. Notice that the SELECT statement in A:B10 exports from each page an area that's 10 columns wide by 100 rows high; you'll need to adjust those values to accommodate your own models.

Here are the macro details:

B3: {SELECT B:A1} This statement selects the cell that contains the file name for the first P&L sheet.

B4: {ANCHOR}{END}{NS}~ This statement selects a range that includes cell A1 of each P&L sheet. You must make sure each cell A1 contains a file name label. The command {NS} corresponds to the keystroke <Ctrl>-<Page Up>.

B5: {RANGE-NAME-CREATE "groups"} Assigns the range name Groups to the selected range.

B6: {FOR \g_ct,0,@SHEETS(groups)-1,1, \g_1}. This looping statement executes the subroutine located at \g_1 (cell B11) once for each sheet in the range Groups. The cell \g_ct serves as a counter: Starting at 0, it increases by 1 on each cycle.

B7: {GOTO}groups~ Returns the active cell to the starting cell after the macro has finished processing all the sheets.

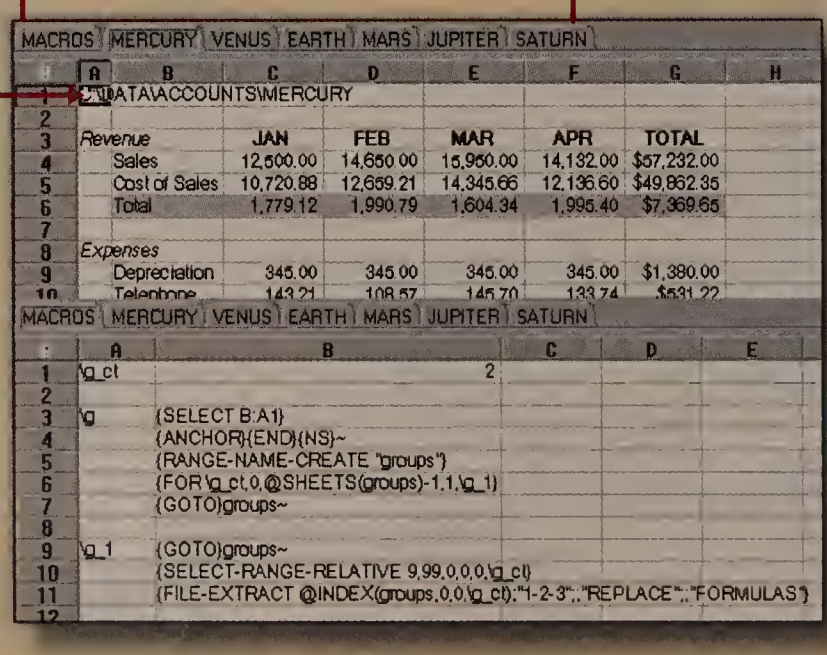
B9: {GOTO}groups~ Moves the active cell to the top cell of Groups (B:A1).

B10: {SELECT-RANGE-RELATIVE 9,99,0,0,0, \g_ct} Beginning at the active cell B:A1, this statement selects a range that measures 10 columns wide by 100 rows high (because the numbers 9 and 99 are offsets from the current cell) on the current sheet, which is represented by the value of the counter \g_ct. You should adjust the column and row values according to the size of your own sheets.

B11: {FILE-EXTRACT @INDEX{groups,0,0,\ g_ct};"1-2-3";;"REPLACE";;"FORMULAS"} Finally, this statement saves the data in the current selection (that is, on the current P&L sheet), using a file name calculated by the formula @INDEX (groups,0,0,\g_ct). This formula gets the current file name from the range Groups based on the value of the counter cell \g_ct.

By Richard Scoville

Richard Scoville is a PC World *contributing editor and a software training consultant in Chapel Hill, North Carolina.* Spreadsheets *welcomes your questions and pays $50 for published items. See page 12 for contact information.*



❶ Set up the worksheets starting on sheet B.

❷ On each sheet, enter a file name (preceded by a path, if desired) in cell A1.

❸ Enter the macro statements shown on sheet A, which is named MACROS.

❹ Select A1:A9 on the MACROS page. Select Range • Name, click the Use Labels button, and click Close.

❺ Press <Ctrl>-G to execute the macro.

FIGURE 2: GOT A MULTIPAGE 1-2-3 FOR WINDOWS WORKSHEET? Follow these steps to set up a macro that will automatically save each page in a file of its own.

6:02 AM – WOKE UP IN DUMPSTER.

7:03 AM – HAD TEQUILA WITH CORN FLAKES.

9:31 AM – PUNCHED OUT THE BARTENDER.

12:02 PM – CALLED MOM.

6:31 PM – KICKED THE CRAP OUT OF 18 BIKERS.

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WORD PROCESSING Q&A

Getting the Font You Want in Any Word Processor

Q I use Word 6.0 for Windows and am generally happy with it. However, I don't like WinWord's default font, and it's a pain to change it every time I create a document. How do I change this font permanently?
Danny L. Clark, Carson City, Nevada

A People ask me this question all the time, for WordPerfect and Ami Pro as well as WinWord. Here's how to change the default font for new documents in all three programs.

WinWord 6.0: To change the default font, you'll need to alter the program's normal.dot template (the one WinWord loads at start-up). Fortunately, WinWord makes this easy to do. Open a document that uses this template and select *Format•Font*. Choose the name and size of the typeface you want to use from the Font dialog box's Font and Size lists. Click *Default*, then click *Yes* to confirm the change. This new default font applies only when you use the normal.dot template.

WordPerfect 6.*x:* The procedure is somewhat trickier here because the program stores font settings with information about each printer you use. Start by selecting *File•Select Printer*. Make sure the printer you use is highlighted in the Select Printer dialog box, then select *Initial Font*. Choose the typeface's name and size in the Font Face and Font Size lists, then click *OK*, followed by *Close*. Your choice will be the new default for all new documents using that printer. Of course, if you decide to use a different printer, you may have to repeat this process.

Ami Pro 3.*x:* Like WinWord, this program stores default font settings in its style sheet templates. To alter the default font, start the program and select *Style•Modify Style*. The default text style, Body Text, should appear in the Style list in the Modify Style dialog box. Leave this setting as it is, then select a new font name and size in the Face and Size lists, and click *OK*. Now select *Style•Save as a Style Sheet*. Don't alter the settings in the resulting dialog box, make sure the With Contents box is unmarked, and click *OK*. Finally, answer *Yes* when Ami Pro asks if you want to overwrite the existing default style sheet.

Remember, while these techniques change the default font for new documents in all three word processors, they won't necessarily alter fonts in documents you've already created. For older files, you may have to open each one and change the fonts manually.

Prompt(less) WinWord Deletions

Q Whenever I try to delete a block of selected text in WinWord 6.0 by pressing the <Delete> key, the prompt 'Delete Block? No (Yes)' appears in the WinWord status bar. This forces me to press Y to finish the deletion. It's a nuisance and is slowly driving me crazy. I know there must be a way to change this, but I can't figure it out. Can you help?
Bonnie Granzow, San Diego

A Figuring out why this was happening to you almost drove *me* crazy—it's just not the normal way WinWord does things. But after digging deeper into the program, I found the problem. You have WinWord's Help for WordPerfect Users feature enabled. This useful tool lets old WordPerfect vets use familiar keystrokes, but it also duplicates annoying features like deletion confirmation.

The solution is simple, as long as you're willing to give up the rest of WinWord's WordPerfect emulation. Select *Tools•Options*, click the *General* tab, then deselect the *Help for WordPerfect Users* and *Navigation Keys for WordPerfect Users* check boxes. Click *OK* to finish the job.

Fast Text Formatting in WinWord

Q I'd like to select blocks of text in Word 6.0 for Windows that aren't adjacent to each other, then format them in one operation. In other Windows programs, I can select noncontiguous items in a list by holding down <Ctrl> and clicking with the mouse, but that doesn't work in WinWord. Do you know of a way to do this?
Arthur Phillips, Chicago

A There are times when I wish I could do the same thing; unfortunately, WinWord won't let us. Still, there are a couple of ways to format text that are almost as fast.

If you want to change just one style attribute—for example, to make text italic—you can do this with a few simple keystrokes. Start by selecting the first block of text you want to format. Apply the formatting, then select each of the other blocks in turn and press **<F4>** to make WinWord repeat the last command you issued.

If you want to perform several formatting commands at once—for instance, to change the fonts and the paragraph width—you can use WinWord's Format Painter tool. Select a section of text and format it the way you want. With the text still highlighted, double-click the *Format Painter* icon in WinWord's toolbar. The mouse pointer changes into a paintbrush. Go to the beginning of the next block of text that you want to format, hold down the left mouse button, and then select the block. When you release the button, Word for Windows "paints" the new text block to look like the old one.

Repeat these steps to format the rest of your text blocks, then press **<Esc>** to turn off the Format Painter tool. But remember, to apply paragraph formatting you have to select the entire paragraph each time; otherwise, WinWord changes only the font.

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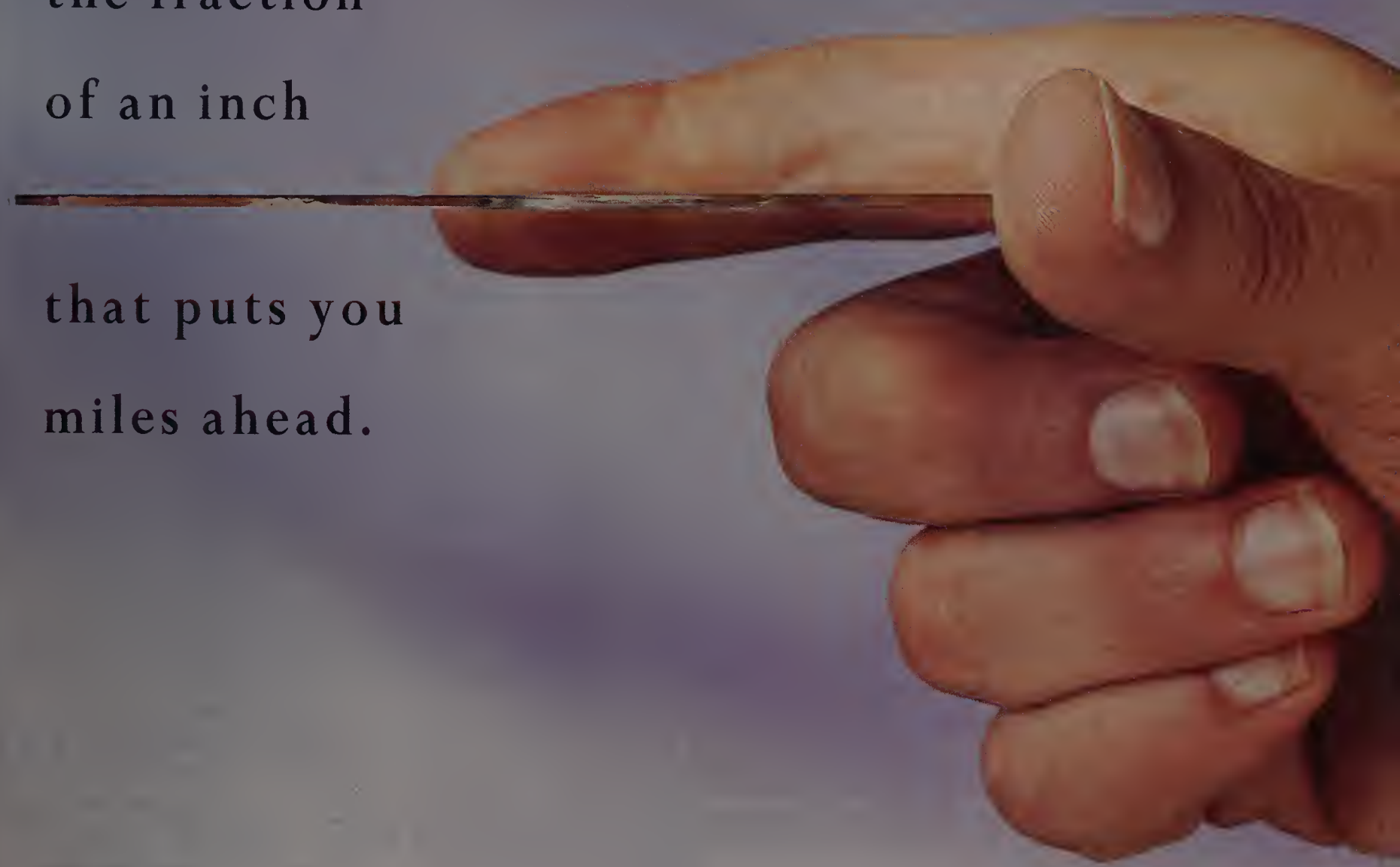

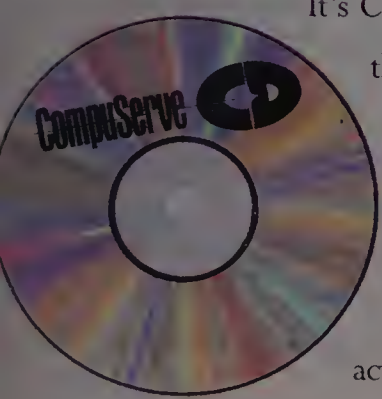

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Color My Word

Q I use WordArt 2.0 to create logos and other text objects in my WinWord 6.0 documents. I recently bought a color printer, and I'd like to colorize some of those objects in existing documents. But when I double-click on an object, I don't see any options for adding color. How do I do this?
Andrew Solodin, Madison, Wisconsin

A It's actually quite easy to change the colors of your WordArt objects, but double-clicking on them isn't the way to do it. Instead, right-click on the object, then select *Open WordArt* in the pop-up menu. In the Font frame of WordArt's main window, you'll find a drop-down list of colors for your text (see **FIGURE 1**). Pick the one you like, then click *OK* to make the change and return to your document. And take a close look at that WordArt window for different fills and other special effects you can use to spruce up your logos and other WordArt objects.

Hiding Text in Ami Pro 3.1

Q I just changed jobs—and word processors. The staff in my new office uses Ami Pro 3.1, which does just about everything that my old favorite, Word for Windows, does except for one thing. In WinWord, I could format text as hidden so that it appeared on screen but didn't print. This was very handy for making brief notes to myself. Is there some way I can do the same thing in Ami Pro?
Karen Smith, Bakersfield, California

A Not directly. But there's a workaround you can use to create nonprinting text. The trick involves fooling Ami Pro into thinking you're going to print on a preprinted form. Here's what to do.

First, select the block of text you want to hide. Then select *Edit•Mark Text•Protected Text*. The appearance of the text won't change on screen, so I suggest you press **<Ctrl>-U** to underline it while it's still highlighted, to make it easy to spot.

To print the file without the hidden text, select *File•Print* as usual, but click the Print dialog box's *Options* button and mark the *On preprinted form* check box. Ami Pro will then print the page without the text that you marked earlier. Unfortunately, you have to select this option each time that you open the file, since Ami Pro doesn't store the setting as a default.

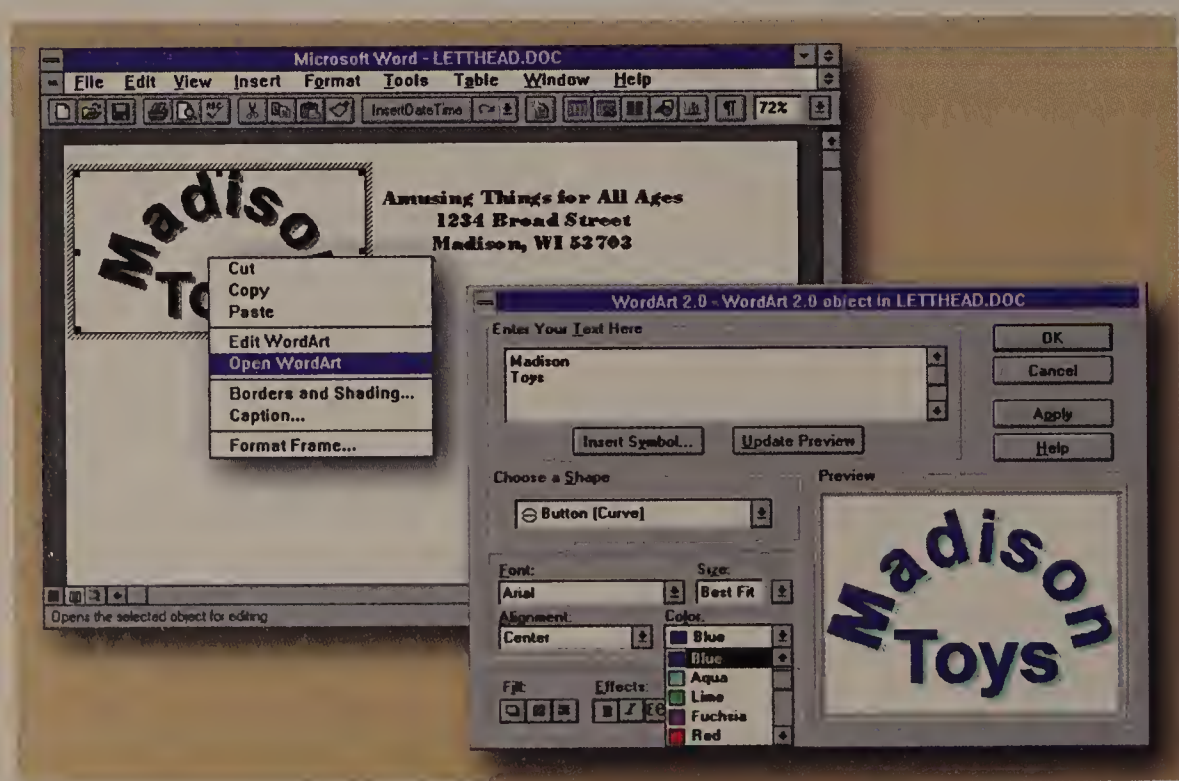

FIGURE 1: TO COLORIZE YOUR WINWORD DOCUMENTS, right-click a WordArt object in WinWord 6.0 and select Open WordArt. WordArt's main window (right) makes it easy to add color, shadows, and special effects to your text creations.

The WordPerfect 6.0 Text Shuffle

Q I use WordPerfect 6.0a for Windows and often create documents that use several different fonts. Whenever I copy a block of text from one spot to another in the same document, WordPerfect preserves the text block's original font, even when the surrounding text in the new location is set in a different font. But I want the text block to take on the font of the new location. Is there a way to do this?
Kathy Jorgensen, Miami, Florida

A Sure thing. Start as you usually do, by marking the block of text you want to copy. Select *Edit•Copy* or press **<Ctrl>-C** to copy the text to Windows' Clipboard. (If you want to move the block of text to the new location, use *Edit•Cut* or press **<Ctrl>-X**.) Now move the cursor to the location where you want to paste the text. Select *Edit•Paste Special*, choose *Unformatted Text* from the Data Type list in the Paste Special dialog box, then click *Paste* or press **<Ctrl>-V**. That's it.

Selecting It All in Ami Pro

Q What's the best way to select all the text in an Ami Pro 3.1 document for pasting into another application?
Newton Barnes, Cleveland

A That's easy. Press **<Ctrl>-<Home>** to move the cursor to the top of the file, then press **<Shift>-<Ctrl>-<End>** to select all the text inside it. This technique selects only text; you'll have to cut and paste graphics separately.

Incidentally, WinWord 6.0 and WordPerfect 6.*x* for Windows have built-in commands for selecting an entire document. In WinWord, select *Edit•Select All* or, better yet, use the keyboard shortcut **<Ctrl>-<NumPad 5>**. In WordPerfect, select *Edit•Select•All*.

By George Campbell

George Campbell is a contributing editor for PC World. Word Processing *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

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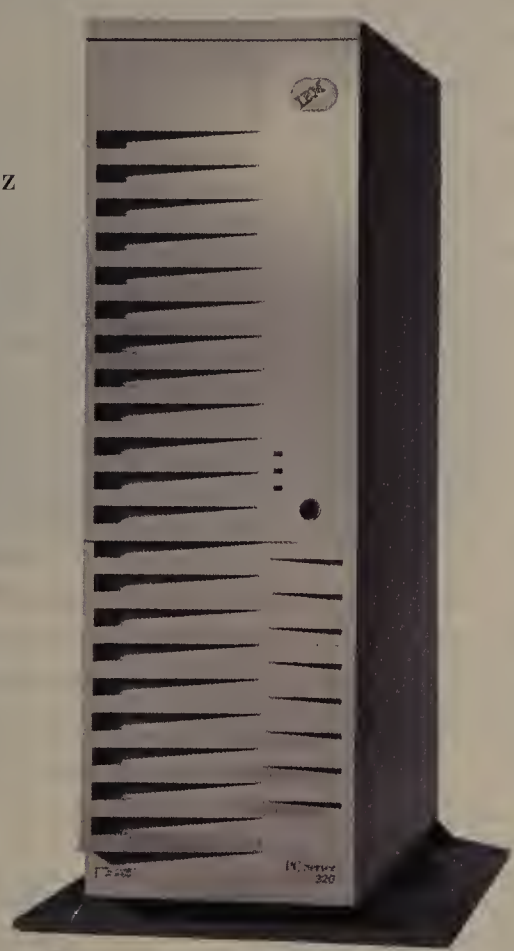

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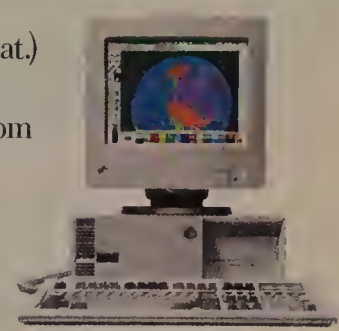

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WINDOWS Q&A

Slow Going With Floppy Saves

Q I run Excel 5.0 on a laptop. When I save a file from Excel to a floppy, it seems to take a long time. Yet when I use File Manager to drag the same file from the hard drive to a floppy, it's all over in an instant. What's going on?
Silvio Melim, San Diego

A What's going on is OLE 2.0. Apps that use this technology, like Excel 5.0 and Word 6.0 for Windows, spend more time reading and writing to save a file, often over 30 additional seconds.

You can stick to your existing solution—save the file and copy it to the floppy with File Manager—but the two-step process is a pain. Try this: In File Manager or Program Manager, choose *File•Run*, type **sysedit**, and press the **<Enter>** key. When the System Editor opens, check the autoexec.bat and config.sys files to find which one contains the line that starts up SmartDrive (a disk cache program that comes with DOS and Windows—either config.sys will contain smartdrv.sys, or autoexec.bat will have smartdrv.exe).

When you find the SmartDrive line, move the cursor after the last letter of smartdrv.exe (or smartdrv.sys) and type a space, then **A+**. Save the file and restart your PC. This tells SmartDrive to cache writes (not just reads, which is the default) to your floppy disk, which should dramatically speed up the process. It may also create a delay between the time Excel says the file is finished saving, and when the save's really done, but you should not have a problem as long as you don't remove the disk until the drive light is out.

Once a Week Revisited

Q In January, you proposed a batch file for getting Windows to display a weekly reminder to back up your hard disk on Fridays as soon as Windows starts ["Windows for All Occasions, Part 1"]. Your solution, which hinged on swapping startup.grp files, contains a flaw—it assumes that Windows always terminates normally. If Windows crashed on Friday and you restarted with your batch file, the Friday program group (.grp) file would replace the regular program group file, and the reminder message would pop up every day. Not an ideal picture.

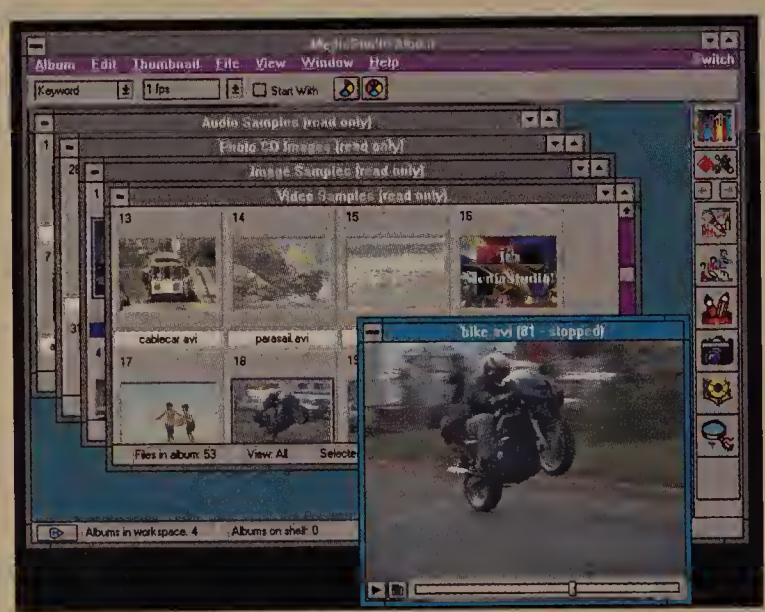
I have a better solution that builds on your suggestion [see **FIGURE 1**]. Notice that I've replaced the lines between ':Friday' and ':end' with just one line. This batch file launches Windows and automatically starts Paintbrush, which displays the backup reminder graphic, reminder.bmp. It also minimizes Program Manager, increasing the probability that users will actually see the message—the ultimate goal.
Dale G. Shields, America Online

A Thanks, Dale! Your suggestion greatly simplifies the process of making Windows do something just once a week. The only thing I can add

```
@echo off
c:
cd\windows
copy template.txt result.bat
date < template.txt | find /c "Fri" >> result.bat
call result
If "%answer%"=="1" goto Friday
win %1 %2 %3
goto end
:Friday
win %1 %2 %3 pbrush.exe reminder.bmp
:end
```

FIGURE 1: WITH THIS BATCH FILE you can make Windows display a message in Paintbrush every Friday at start-up.

Windows Toolbox



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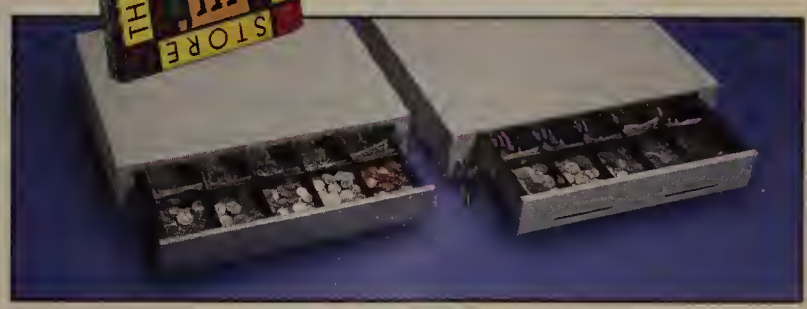

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is that any applications in your StartUp group should also run minimized so that the Paintbrush graphic will in fact be front and center. For those who've forgotten, the Run Minimized check box is in Program Manager's *File• Properties* dialog box; one by one, highlight the StartUp icons; open the dialog box; and check *Run Minimized.*

Once a Month Revisited

Q I have a relatively simple solution to your problem of getting Windows to run a program automatically at start-up just once a month ["Windows for All Occasions, Part 2," January]. It takes advantage of a DOS command called fc (for "file compare"), which reports any differences between two files—in this case, between a file containing the current date and a file containing the date of the last time the batch file was run.

Peter Sand, Minneapolis

A This is a terrific solution for getting Windows to do something once a month. For simplicity's sake, I've worked Peter's suggested change into the complete batch file in **FIGURE 2**.

The original batch file, designed to replace your usual Windows start-up command, automatically launched Microsoft's Anti-Virus for Windows program (mwav.exe) on the 15th of every month. The problem was, if you didn't run Windows on the 15th, you'd skip a month. The new batch file solves this by using DOS's fc command with the /b switch. It compares the file containing the current date (nowdate.txt) with a file containing the last date the batch file was run (olddate.txt) and reports any mismatch.

The only mismatch that matters is in the two-digit month number. When the second digit of the current month differs from the second digit of the month when the batch file was last run (07 instead of 06, for example), fc /b reports a discrepancy at binary location '00000015'. (The 15 has nothing to do with the 15th of the month; that's just a coincidence.) The Find command in the batch file searches for the '00000015' trigger every time you start Windows. When it finds that number, the If command jumps to the :newmonth portion of the batch file, which contains the mwav.exe start-up command. The beauty of this scheme is that you can start up Windows on any day in a subsequent month, and Anti-Virus loads automatically.

You'll need to create a file called **template.txt**, as instructed in the January issue: Open Notepad, press **<Enter>**, and type **set answer=** (make sure there's no space before the equal sign and no carriage return after it), then save the file in your Windows directory. Finally, use Notepad to create the batch file in Figure 2, and save it with a simple name like **wn.bat**. From now on, start Windows by typing **wn** instead of win at the DOS prompt. Naturally, you can change the path and file information to suit your system—and of course you can use this batch file to run almost any program once a month.

```
@echo off
c:
cd\windows
copy template.txt result.bat
date < template.txt > nowdate.txt
fc/b nowdate.txt olddate.txt|find/c "00000015" >> result.bat
copy nowdate.txt olddate.txt
call result
If "%answer%"=="1" goto newmonth
win %1 %2 %3
goto end
:newmonth
win %1 %2 %3 c:\dos\mwav.exe
:end
```

FIGURE 2: FOR ONCE-A-MONTH TASKS, this batch file starts a program if the month has changed since the last time the batch file was run.

TrueType Versus DeskJet

Q I have a Hewlett-Packard DeskJet 500C, and my TrueType fonts don't work with it. How can I correct this?

Donna Peterson, Helena, Montana

A All you need is an upgraded Windows 3.1 driver for the printer. Hewlett-Packard will send you this driver for a nominal fee if you call the company at 303/353-7650. Or you can download it from HP's CompuServe forum: Just type **go hpper**.

By Scott Dunn

Scott Dunn is a contributing editor for PC World *and coauthor of* 101 Windows Tips and Tricks *(Peachpit Press, 1992, 800/283-9444).* Windows *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

USER GROUP TIP

Windows COM Port Buffers

If you want Windows to use the buffer of a serial port's 16550 UART chip, place this line in the [386Enh] section of your system.ini file: COMnFIFO=On (n represents the number of the COM port for which you are activating the buffer).

Kern Reese
MicroLink PC Users Group of Southern California

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DATA MANAGEMENT Q&A

Carrying Values Forward in Access

Q I use Microsoft Access 2.0 to track my utility bills (gas, water, and so on). My utility table has fields for the previous meter reading and the current one. When I enter a new bill, can I make Access copy the previous bill's current meter reading into a new record's Previous Meter Reading field?
David S. Groves, Colleyville, Texas

A The easiest approach is to create a button that runs a macro. The macro will duplicate the current record, copy the Current Meter Reading value to the Previous field, then blank out Current Meter Reading and any other fields you don't want duplicated.

With your form open in design mode, click the *Command Button* tool, and click and drag on your form where you want to place the button. Access opens the Command Button Wizard, which you can't use to create this particular macro. Click *Cancel* to leave the Wizard.

Back in your form, right-click the new button and select *Properties* from the pop-up menu. In the resulting dialog box, enter **New Bill** in both the Name and the Caption fields. Scroll down and select the *On Click* option, click the ellipsis button (...), select *Macro Builder*; and name your macro **New Bill**. Access brings you into the Macro window, where you define your macro's actions. Click the first line in the Action column, click the arrow for the drop-down menu, and select *DoMenuItem*. At the bottom of the window, use the same click–drop-down–select procedure: for Menu Bar, choose *Form;* for Menu Name, *Edit;* and for Command, *Select Record.*

Repeat the process for the second and third lines in the Action column; for the second, select the Command *Copy;* on the third, *Paste Append.*

In the fourth line, select the Action *SetValue.* At the bottom of the window, enter the Item **[Forms]![Utilities]![Previous Meter Reading]** and the Expression **[Forms]![Utilities]![Current Meter Reading]**, assuming your form is named Utilities and your fields are Previous Meter Reading and Current Meter Reading.

To empty Current Meter Reading, add another *SetValue* action, this time with the Item **[Forms]![Utilities]![Current Meter Reading]** and the Expression **Null.** Create equivalent *SetValue* actions to blank any other fields you want empty. Save, and exit the Macro and Properties window.

When you want to enter a new bill, find the last record for the same utility and click the *New Bill* button. You'll get a new record with the previous reading already filled in.

Updating Linking Values in Paradox 5.0 for Windows

Q I use two Paradox 5.0 for Windows data files, names.db and calls.db, to keep a history of client phone calls. Names.db is keyed on two fields, Last Name and First Name; calls.db is keyed on Last Name, First Name, and a date field. I've created a form for names.db that shows one name at a time along with a table of any related records in calls.db.

Everything works fine until I need to change a person's name, which causes the entire history of calls for that person to disappear. When I check the files in table view, I can see that the records in calls.db still have the old name. I thought Paradox would handle this kind of change automatically and keep the links between records, even when the linking values are changed. How can I keep my files in order?
Eleanor Black, Evanston, Illinois

A Paradox can use a feature called *referential integrity* to protect the values used to link data files. But for it to work, you have to set it up when you create or restructure a table.

To establish referential integrity for names.db and calls.db tables, right-click *calls.db* in the Project Viewer and select *Restructure.* In the Restructure dialog box, under Table Properties, select *Referential Integrity* and click the *Define* button. Double-click *names.db* under Table, and *Last Name* and *First Name* on the Fields list. Last Name and First Name fields should now appear under both Child Fields and Parent's Key. Leave the Update Rule set to *Cascade.* Click *OK*, enter a name, and click *OK* again to return to the Restructure dialog box. Click *Save* to finish.

Now when you change a name in names.db, Paradox will automatically update any related records in calls.db. If you make such a change in a form that links the tables, calls' records will still disappear, but you can bring them right back by pressing **<Ctrl>-<F5>**.

Finding a Range of Records With Approach

Q I have trouble pulling just the records I need with Approach 3.0. I'd like to look at a month's entries, and I'd think the formula '>=3/1/95 and <=3/31/95', used in a date field in Find mode, would do it. But this gives me all the records dated 3/1/95 on, well past the end of March. What can I do?
Jillian West, New York

A Use an ellipsis in your find request. In the Find Environment, click on the date field you wish to search, enter a formula like **3/1/95...3/31/95**, and press **<Enter>**. Approach will find all the records for and between those dates.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World *and author of* The Paradox 5.0 for Windows Handbook *(Random House Electronic Publishing, 1994, 800/793-2665).* Data Management *welcomes your questions and pays $50 for published items.* *See page 12 for contact information.*

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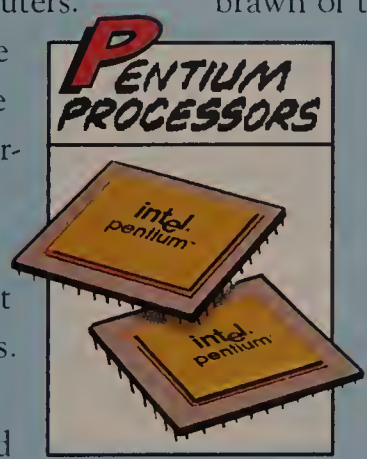

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PUBLISHING & PRESENTATIONS Q&A

Adding Sweep to Harvard Shows

Q I recently saw a Harvard Graphics 3.0 screen show that opened with the word *Welcome* spiraling onto the screen. How'd they do it?
Becky Overfield, Livermore, California

A The effect you saw was created with Harvard's special sweep option. Sweeping produces that motionlike effect by quickly displaying multiple copies of an object (in this case, a block of text). Here, for example, is how you'd create that spiraling *Welcome*.

1. With your presentation open, select *Slide•Add slide*. In the Add Slide dialog box, select *Title* as the slide type. Under Options, scroll down to the bottom of the list and select the layout called 'Title'. Click *OK*.

2. In the Slide Editor, double-click the word *title* to start editing the text; in our example, you'd type **Welcome**. Press **<Esc>** when you're done.

3. Select *Graphics•Special Effects* to open the Special Effects dialog box, then follow the instructions in "Harvard Graphics Sweeping Special Effects." While you're still in the Special Effects dialog box, you can try different combinations of color, sweep direction, number of replicas, and so on. When you're done, click *OK* to finish.

This is just one example of a spiraling effect. You can also apply the sweep effect to other selected objects, such as a ball bouncing across the screen. Have fun!

Have Screen Shows, Will Travel

Q I use PowerPoint 4.0 and want to distribute self-running screen shows for clients to play on their PCs. PowerPoint has a run-time playback utility, but it only runs in Windows. Are there any presentation programs with DOS run-time utilities?
Al Cocconi, Oak Brook, Illinois

A Both Freelance Graphics 2.*x* and Harvard Graphics 3.0 will do what you want. In Freelance Graphics, if you select the 'Run screen show directly from DOS' option, Freelance copies both the presentation files and the run-time utility show.exe to the disk drive and directory you designate. To play the presentation from DOS, you move to the directory containing the demo, type **show** *file name*, and press **<Enter>**. The process is similar with Harvard Graphics: At the DOS prompt, you type **hgplayer** *file name* and press **<Enter>**.

By Richard Jantz

Contributing Editor Richard Jantz is an electronic publishing and presentations consultant in Berkeley, California. Publishing & Presentations *welcomes your questions and makeover candidates.* PC World *pays $50 for published questions and $200 for redesigned items.* *See page 12 for contact information.*

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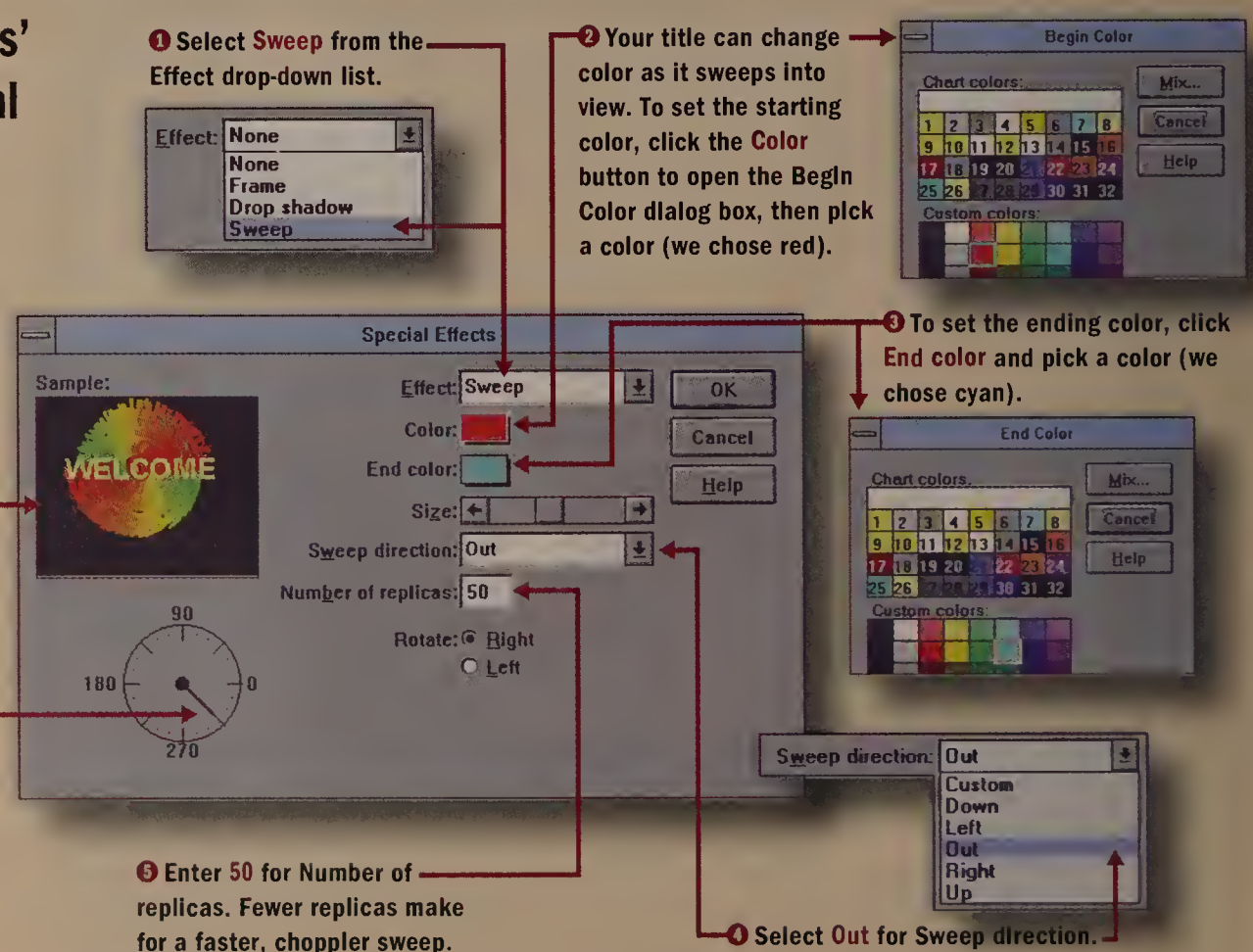

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HARDWARE Q&A

Upgrading to Enhanced IDE

Q I'm thinking of buying a second IDE hard drive, and I like the prices I've seen on 540MB Enhanced IDE models. But my system doesn't support Enhanced IDE, which means I wouldn't get the speed benefits—and I'd lose 12MB of disk space, since standard IDE tops out at 528MB. Do I need to buy an Enhanced IDE interface card, upgrade my BIOS, or what?
Abraham Phantazein,
Berkeley, California

A If your system has a *flash* BIOS—one that can be reprogrammed—your system manufacturer may have a free BIOS upgrade, available via a BBS, that supports Enhanced IDE. You download the file, run a simple upgrade routine, and immediately gain Enhanced IDE support (along with possible other benefits, such as Plug and Play support). Alternatively, some companies will send you upgrades on disk for a nominal fee.

Enhanced IDE's main perks are support for disks larger than 528MB; the ability to connect four IDE devices; and support for speed-enhancing techniques, such as read/write multiple and Programmable I/O Mode 3 or 4. If your new BIOS has Enhanced IDE support, you'll break the 528MB barrier and get support for at least four IDE drives. But you won't get the speed increase. And there's no way you can really hook up four drives without using two IDE connectors (you can put two drives on each connector).

If you don't have a flash BIOS or can't obtain a flash BIOS upgrade to your liking, you might try getting BIOS replacement chips from your manufacturer or from a third party, such as Unicore Software (800/800-2467) or Micro Firmware (405/321-8333). The chips will probably cost you between $30 and $80—if you can find the right BIOS.

Third-party BIOS upgrades can be tricky. If you want to attempt a chip upgrade, start by running your system setup routine and writing down all of the essential configuration information—paying special attention to the hard disk parameters. Then remove the old chips with a *chip puller* (a pair of tongs you can get from any electronics store) and plug in the new chips. If your configuration information goes south when you plug in the new BIOS, reenter the settings manually.

A better route is to buy an Enhanced IDE interface card from GSI (800/486-7800). Its Model 18, an ISA card, costs $39 on the street, supports drives up to 8.2GB, and provides the read/write multiple speed enhancement. A VL bus extension to this card should be available for under $80 by the time you read this. The extension provides Programmable I/O Modes 3 and 4—speed enhancements available only for local bus systems. However, the additional throughput that Enhanced IDE offers will probably be noticeable only in multimedia applications.

CPU type	Internal processing speed (MHz)	I/O speed (MHz)	Usual local bus type/speed (MHz)
486DX2-50	50	25	VLB/25
486DX2-66	66	33	VLB/33
DX4-75	75	25	VLB/25
DX4-100	100	33	VLB/33
Pentium-60	60	60	PCI/33
Pentium-66	66	66	PCI/33
Pentium-75	75	50	PCI/33
Pentium-90	90	60	PCI/33
Pentium-100	100	66	PCI/33

FIGURE 1: GUIDE TO CPUs AND THEIR BUSES. The VL bus speed is tied to the CPU's speed, while the PCI bus's 33-MHz speed is independent of the processor's.

Dueling Buses: PCI Versus VL

Q What's the difference between a PCI and VESA local bus (VLB)? Which is better? And why do Pentiums always seem to have PCI buses?
Ken Harrington, Internet

A Both VLB and PCI are 32-bit buses that run at a maximum speed of 33 MHz (a few systems have 50-MHz VL buses). VLB runs at the processor's I/O speed—the processor's interface speed with the motherboard—while the PCI bus is currently fixed at 33 MHz, meaning it's not a true local bus. Thanks to additional logic and buffering, however, PCI boards generally run a bit faster than VLB devices.

The answer to your question about the link between Pentiums and PCI buses is pretty simple. Because the I/O speed of Pentium processors is generally 60 MHz or higher, a VLB board (unlike a 33-MHz PCI board) would have to run very fast—faster than most peripherals can handle. No current 486 processor talks to its motherboard faster than 33 MHz (the DX2s and DX4s run faster internally), and all VLB boards can operate comfortably at that speed. VLBs and boards are also slightly cheaper to manufacture, which complements the dirt-cheap prices of 486 PCs. **FIGURE 1** shows which bus generally goes with which processor.

Interestingly, the new Pentium-75s have an I/O speed of 50 MHz, which means manufacturers can use slightly less expensive secondary caches and motherboard components while still achieving speeds higher than that of a 66-MHz Pentium. Once these systems are commodity items, no one will have any reason to consider a 486, and the VLB will fade into history.

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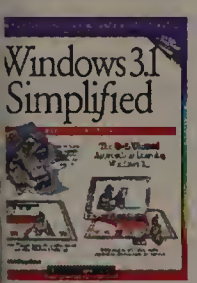

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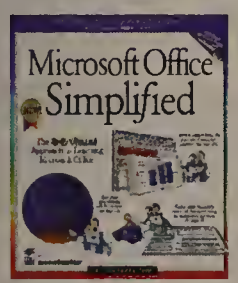

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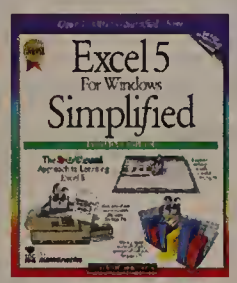

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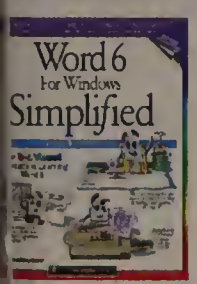

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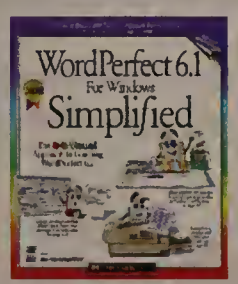

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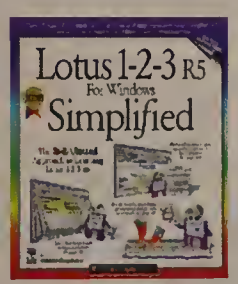

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CD-ROM Drives: 2X Versus 3X Versus 4X

Q I'm not sure how fast a CD-ROM drive really needs to be. I've heard that double speed should be the minimum, but what practical advantage do triple-speed or even quad-speed drives provide? Is the faster speed worth the extra money?
Bill Fulton, CompuServe

A The bottom line is this: With most of today's CD-ROMs, quad-speed drives don't improve performance noticeably over that of double-speed drives; at best they drop 10 to 20 percent fewer frames during video playback. Nonetheless, you should still buy a quad-speed drive if you can afford it, even though double-speed models cost less than half as much.

Here's why: As more and more applications are optimized to take advantage of quad-speed drives, the more those drives will be able to show off their speed. On the other hand, nobody is optimizing applications for triple-speed drives, making them a complete waste of money.

By the time you read this, not only will more optimized applications be available, but you should be able to buy a quad-speed drive for around $200—about half what one cost six months ago. Quad is the new standard, and I strongly suggest you buy into it.

CD-ROMs and Enhanced IDE Performance

Q In your March column you wrote that IDE "can transfer data only as fast as the slowest device allows, and your CD-ROM drive is much slower than your hard disk." Pardon me? A week ago I opened up my Gateway 2000 486DX2-66V and installed a new double-speed IDE CD-ROM drive, the NEC V2i, on the same ribbon cable as my hard disk. Funny thing, though—I haven't noticed any slowdown. Am I missing something here?
Walt Crawford, Mountain View, California

A No, but I missed two things. First, I should have specified that "fast as the slowest device" relates only to *local bus* IDE interfaces and *Enhanced* IDE drives. This still applies to your system, which has a VESA local bus. Second, I neglected to explain exactly what "fast" and "slow" mean in this context. It all has to do with the main speed benefit of Enhanced IDE: Programmable I/O Mode 3 (or, more recently, Mode 4). For example, if one drive supports the old-fashioned PIO Mode 2 and the other supports the much faster PIO Mode 3, then both devices will run in Mode 2, because the interface must talk to all devices on the same channel in the same mode (all higher modes are backward compatible). When I wrote the column, all CD-ROM drives were Mode 1 or 2. Recently, a number of IDE CD-ROM drives arrived that support Mode 3, including the NEC drive you mentioned. Sorry for misleading you or any other readers.

By Eric Knorr

Eric Knorr is a contributing editor for PC World *and editor and principal author of* The PC Bible *(Peachpit Press, 1995, 800/283-9444).* Hardware *welcomes your questions and pays $50 for published items. See page 12 for contact information.* ■

COMING UP

Top Products: PC World's World Class Awards

We polled industry experts and editors, analysts and user group presidents. Here are the best products of the year in more than 60 categories, including desktop and notebook PCs, printers, monitors, online services, Web browsers, CD-ROMs, and more. Plus the Product of the Year.

Video and Graphics Acceleration on a Single Board

Digital video is the new wave, from action-packed CD-ROM games to dynamite business presentations. We review 12 accelerators and put them through a battery of tests for video quality and through our regular Windows test suite. Our Best Buy is an affordable $233 board that combines fast graphics and smooth video.

Also Next Month

- ▶ Top 20 Updates on the Month's Best Budget, Power, and Notebook PCs
- ▶ Mobile Multimedia: What's Best for Business Pros on the Move, From CD-ROM Notebooks to LCD Projection Screens
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STAR-DOT-STAR TIPS

Locking Windows

I work in a public library where we're concerned that providing Windows and Windows applications for our patrons could threaten the security of our systems. (We've already protected our DOS machines against file deletion and hard drive reformatting.) Luckily, we discovered some progman.ini settings that limit what you can do in Program Manager, and thereby in Windows. These settings go into an optional section of progman.ini called [Restrictions].

NoRun=1 grays out Program Manager's File•Run menu item, making it impossible to launch a program that isn't set up with an icon.

EditLevel=4 prevents users from deleting, adding, editing, or moving program groups, program items, or program information.

NoFileMenu=1 removes the File menu entirely. If you use this setting, the previous two are unnecessary.

NoClose=1 prevents users from exiting Windows.

To edit progman.ini, select *File•Run* from either Program Manager or File Manager, type **progman.ini**, and press **<Enter>**. If the file doesn't have a [Restrictions] section, start a new line at the bottom, type **[Restrictions]**, press **<Enter>**, and below that line type the entries you want to use, one per line.

Securing Program Manager isn't much good if users can bypass it or alter progman.ini. You must also remove from Program Manager any applications that can launch other apps, including File Manager and the DOS prompt.

Dick Manikowski, Detroit

Editor's note: Restricting Program Manager is a good way to lock up a Windows system that's used primarily for in-house or turnkey applications or for Internet access. And by turning on progman.ini's read-only property while you're still in File Manager, you can keep users from altering the file.

Unfortunately, Windows was not designed to be truly secure, and a clever user can still break into the system. Where security is very important, the best solution is to use a network and to write-protect applications and data on portions of the network drive. But where security concerns are limited, as in a library, these restrictions should suffice to keep all but the most savvy saboteurs from hurting your systems.

Redesign Your Ears in WinWord

Look at the top of a page in a dictionary or reference book, and you're likely to find a special type of header called an *ear*. By listing the first and last entries on the page, an ear shows at a glance whether you're at the right place in the book.

It's not well documented, but you can use WinWord 6.0's StyleRef fields to create ears. By default, a StyleRef field searches backward through your document, starting from the place where it was inserted, until it finds the first paragraph formatted with a particular named style. It then displays the text it found. In a header or footer, a StyleRef field normally reprints the first paragraph on the page that is formatted in the given style. The trick to making a good ear is to have fields search for the first *and* last use of the style on the page and print less than the entire paragraph.

Suppose that you're writing a film encyclopedia, and you use the subheading "Preston Sturges: Illegitimacy of the Sacred." If you set your StyleRef field to your subheading paragraph style, you will get that whole title in your header. A much more readable header would simply refer to the section as "Sturges."

To do this, create a character style: Select *Format•Style* and click *New*. In the New Style dialog box, enter the Name **EarCharStyle** and select the Style Type *Character*. Leave the Based On setting at *Default Paragraph Font*, and define the style to use the same font settings as your paragraph heading. After you've closed the dialog boxes, select the name *Sturges* in your subhead, and assign it to the style *EarCharStyle*. The word will not look any different. Go through your document and assign the style to the key word in every subhead.

Now it's time to create your ear header. Select *View•Header and Footer*. Format the header as you like. To insert a reference to the first key word on each page, select *Insert•Field*. In the resulting dialog box's Categories field, select *Links&References;* for Field Names, select *StyleRef*. In the Field Codes text box, enter **EarCharStyle**. When you click *OK*, your header will contain the reference.

A proper ear, however, needs references to the first and the last entry on a page (for example, "Stooges–Sturges"). This requires adding a hyphen and another StyleRef field, this one searching forward to the page's last block of text with the given style. Create this field just like the other one, except in the Field Codes text box, enter **EarCharStyle \l** (that's the letter *l*, for *last*).

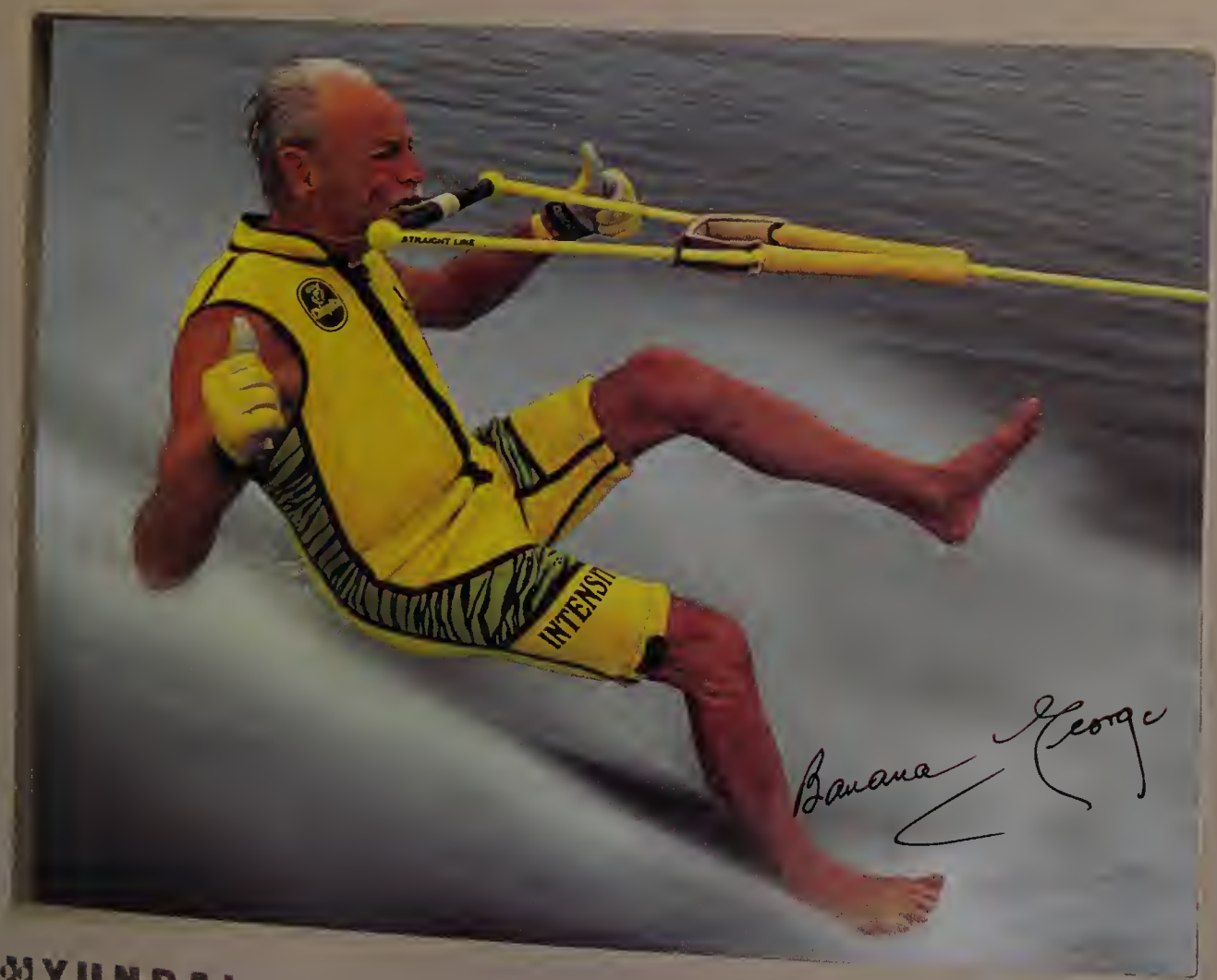
Here's an extra little trick: Suppose you want the ear to display some text that doesn't appear anywhere in your

USER GROUP TIP

A Defrag Secret

Use DOS 6.*x*'s undocumented defrag /q command to move data files close to the beginning of your hard disk. It's a quick way to gain a tiny speed improvement without a full defrag.

Austin Mereno
MicroLink PC Users Group of Southern California



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document. Find some unused space on the page (say, at the end of a paragraph), type in the text, give it the style **EarCharStyle**, and white it out by selecting *Format•Font* and the Color *White* (turning on the Hidden option doesn't work). Shrink the text to a tiny size if necessary so it doesn't push any other text out of the way; the size and color won't affect what appears in the ear.
Lou Argyres, Richmond, California

WordPerfect File Sleuth

Every Windows program you ever installed has probably left .dll and .drv files in your Windows and Windows\ system directories. It's smart to clean those directories of unwanted files. But how do you figure out where a given .dll and .drv came from?

Use WordPerfect's file viewing feature for this job. Select *File•Open*. For List File Types, select *All Files (*.*)* and browse the directory you would like to clean up. Select a .dll or .drv you're wondering about, and click *View*. WordPerfect will display information about that file—often including the copyright owner and the file's purpose. This is a big help when you're deciding whether to delete the file.
John F. Orzechowski, Bridgewater, New Jersey

Editor's note: The easiest way to find your .dll and .drv files in WordPerfect is with the QuickFinder option. In WordPerfect 6.0 and 6.1, select *File•QuickFinder*; or once you're in the Open File dialog box, click the *QuickFinder* button. In the resulting dialog box, for Search In, select *Subtree* and enter **c:\windows**. For Path(s)/Pattern(s), enter ***.dll, *.drv**. Click *Find* for a list of the files worth considering. The *View* button will still show you where the file came from. When you want to delete a file, select *File Options•Delete*.

It's a shame File Manager doesn't have such viewers, but you can augment it with integrated file-viewing programs like System Compatibility's Outside In. Some File Manager replacements, notably Norton Desktop and PC Tools, also have viewers for .dll and .drv files.

Blast From the Past

In January's *Star-Dot-Star*, you printed a batch file that erased the annoying message Microsoft added to chkdsk in DOS 6.2. There's another way to hide the message, and it doesn't require a batch file: Use the older version of chkdsk that came with an older DOS version. To make the old version work, you'll need to load DOS's setver utility.

First, add the line **device=c:\dos\setver.exe** to your config.sys file. (If you're running DOS's EMM386 memory manager, you can load the program high by using **devicehigh=c:\dos\setver.exe**; if you're using a third-party memory manager, check the documentation.)

Next, in your DOS directory, rename the file chkdsk.exe to something like **chkdsk62.exe**, then copy chkdsk.exe from an older DOS into its place. Unlike most files on DOS distribution disks, chkdsk.exe is never compressed.

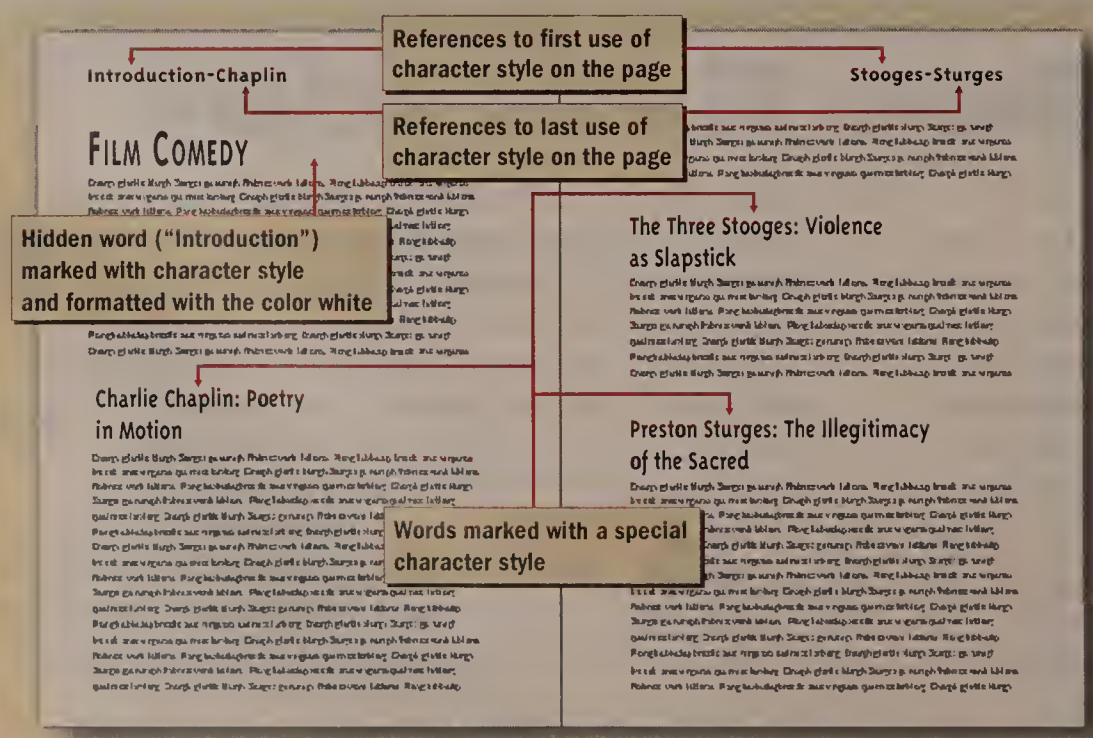
Your last step is to enter the command **setver chkdsk.exe** *x.x*, replacing the *x's* with the version number of your older DOS. Reboot, and your chkdsks will be the older, message-free version.
Walter H. Tortorici, San Jose, California

Editor's note: We tested this tip with chkdsks from DOS 5.0 and 6.0, and it worked fine on an uncompressed drive. Versions older than 6.0, however, may cause problems on DoubleSpace- or DriveSpace-compressed drives. As best we can tell, no configuration of setver will make IBM's chkdsk.com run under MS-DOS.

If you want to run an older utility on a newer version of DOS, setver is a good alternative. Now that some of the original DOS utilities come on a supplement disk that must be ordered specially from Microsoft, it may be easier to use setver than to wait for a disk.

Of course, running setver involves loading one more device driver into memory—always a potential problem. If you're not already loading setver to make some other program compatible, you may want to think twice about doing it just to get rid of a pesky message. On the other hand, if you already load setver, this trick can get rid of that message painlessly.

By Brett Glass



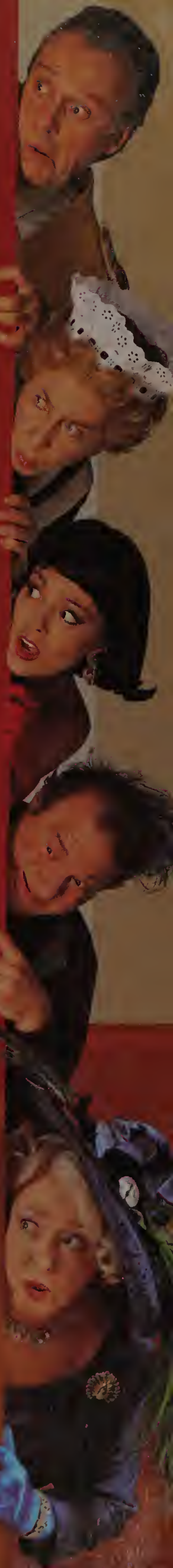
ADD DICTIONARY EARS—special headers that reference the beginning and end of the page—to WinWord documents through clever use of character styles.

Brett Glass is a contributing editor for PC World. Star-Dot-Star *welcomes your tips macros, batch files, and short programs and pays $50 to $200 for published items. See page 12 for contact information.*

Mr. Boddy has been murdered, and his killer remains at large. But sometime today before the scheduled 8:00 p.m. reading of Mr. Boddy's last will and testament, the Murderer Will change the document to read in his or her favor.

Unfortunately Boddy's closest living relative, Mr. Green, is out of town on business and was not informed of his cousin's death. But those who have gathered at the Boddy mansion for the reading include Mrs. Peacock, his eccentric sister-in-law; Colonel Mustard, an old army buddy; Professor Plum, a dear friend and classmate during his days at Yale; Miss Scarlet, a "special friend"; and Mrs. White, his loyal servant of 25 years.

Please help us find the killer by determining who changed the will... where... and with what...



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The SoundBook II With Convenience Is Served

Personality Modules...

7:45 p.m. and tensions are high. The anticipated reading of the will is only minutes away. But with so many unique personalities in one room...MidWest Micro's SoundBook II should feel right at home!

When the main course is murder, people tend to lose their appetite—but they still hunger for convenience. And that's where the *NEW* SoundBook II comes in. Featuring a programmable Personal TouchPad, two RAM compartments and a modular design, this MidWest Micro Notebook is dressed to kill. So before we interrogate the other suspects at the table, let's investigate the SoundBook II...

Powerful Features...Weak Alibi

Who *knows* where this portable was on the night in question? Weighing only 6 lbs., it could have gone *anywhere*! Some eyewitnesses claim they saw the SoundBook II with a built-in floppy drive at 6:37 p.m. While another source swears the same drive bay was carrying an AC adapter at precisely 6:40! What makes the SoundBook II such a master of disguise?—It uses special compact peripherals, A.K.A. Personality Modules, that fit its modular 3.5" drive bay. Enjoy the floppy drive and AC adapter modules that come with your SoundBook II. And feel free to order additional modules like a 3.5" CD-ROM drive, a 14.4 Kbps voicemail fax modem, an extra hard drive and an extra battery.

Evidence Stacked In Your Favor

If *speed* is your motive, you may want to check out MidWest Micro's Pentium™ Processor Based SoundBook Plus. Like the SoundBook II, it comes with 16-bit stereo audio and built-in speakers. But this SoundBook *also* features a 75 MHz or 90 MHz Intel® Pentium Processor. And if you think *that* sounds like a setup, get a load of The Real Warranty. It covers all MidWest Micro Notebooks for a full three year sentence—parts *and* hard labor included! We can only assume that Mr. Boddy (being of sound mind) would have loved both MidWest Micro SoundBooks.

Contributing To The Delinquency Of A Diner?

Although it's unlikely that these MidWest Micro Notebooks are capable of murder, they *may* be found guilty of aiding and abetting. In fact, one of these guests may have already used a SoundBook to change Mr. Boddy's will... Perhaps Mrs. Peacock is doing it *right now*!—Or maybe she's just playing a little Microsoft® Golf.

Since we have a little time before Mr. Boddy's lawyer arrives, let's reconstruct another way this heinous crime may have been committed...

intel inside pentium

" Fastest portable we've ever tested, a fine desktop replacement"
— *PC World*, April 1995

" MidWest Micro wowed us with its Elite Pentium SoundBook Plus, the first Pentium-90 notebook we've tested; its performance blows every other reviewed mobile out of the water."
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" ...produced the highest Windstone 95 score of all reviewed systems"
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PC WORLD TOP 20 Mobile PCs

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— *PC World*, January 1995

PC WORLD TOP 20 Power Desktops

"I can't believe these people didn't put lunch on the itinerary," the Colonel grumbled. "And you would ***think*** *a person with this much money could afford better lunch meat." Was it merely hunger pains that brought Colonel Mustard into the kitchen this afternoon? Or was it Mr. Boddy's MidWest Micro Home PC... and* ***revenge****!...*

Mustard hadn't touched a computer since his code cracking days in the Middle East. But this "MidWest Micro Home PC" looked nothing like *that* relic. Typing in the secret password with his one good hand, the Colonel checked his watch again. He knew exactly how long it would take the IntelDX4™ 100 Processor to find the will, make the changes and save them on the Home PC's 850 Mb hard drive. "Not bloody long at all," he said with a smirk.

Colonel Mustard had planned his strategy very carefully. And after reading six computer magazines cover-to-cover, he learned that MidWest Micro Desktop Systems are available with Intel486™ and Pentium™ Processors, double- and quad-speed CD-ROM drives, voicemail fax modems and hard drive capacities up to 1.6 Gb! And whether you order a multimedia-packed Home PC or an Office PC stocked with powerful business software, you should always expect an ambush of high performance. But even nine weeks at boot camp, two wars and a Purple Heart didn't prepare the Colonel for what he was about to witness...

Opening the Home PC's Microsoft® Family Bundle, Mustard found an arsenal of interactive CD-ROM software—Encarta™ 95, Works, Money, Scenes, Dangerous Creatures and Golf were his to conquer. Before he knew it, the 15" color screen had exploded into multimedia mutiny. And he was even *more* impressed with Microsoft Bob™. Featuring eight household management programs in one efficient package, this new recruit had all the makings of a great soldier.

By this time the Colonel was distracted from his original covert operation. So he set a course for the library to see what Mr. Boddy's *120 MHz Office PC* had to offer...

Who killed Mr. Boddy and changed his will? The rest of the investigation is up to you...

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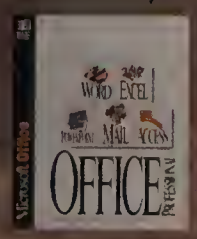

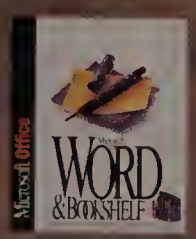

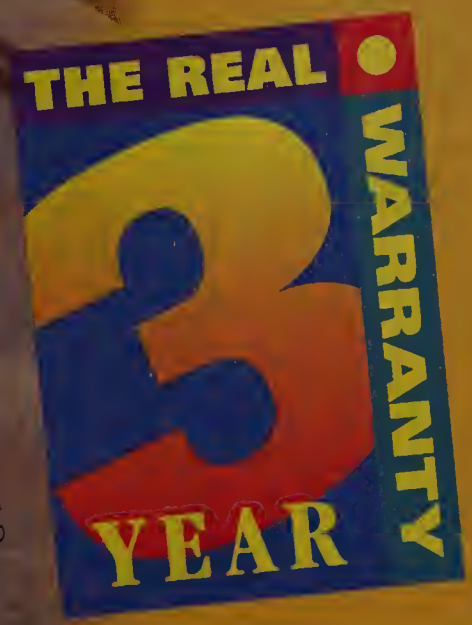

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Peripherals
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AD#R06

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- PCI Fast IDE Interface
- Quad-Speed CD-ROM Drive
- Microsoft® Bob™
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- Microsoft Complete Baseball CD
- 16-Bit Stereo Sound Card
- Digital Quality Speakers
- 9624 Fax Modem with Voicemail
- 3.5" Disk Drive
- 14" SVGA .28 N/I Color Monitor
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- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS® 6.22 and WFW 3.11
- EPA Energy Star Compliant
- The Real 3 Year Warranty

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- 850 Mb IDE Hard Drive
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- Quad-Speed CD-ROM Drive
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- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Word 6.0, Bookshelf, Encarta 95, Works Multimedia Edition 3.0 & Money 3.0
- The Real 3 Year Warranty

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#008777
- Intel 90 MHz Pentium Processor
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- PCI Fast IDE Interface
- PCI Local Bus Graphics with 1 Mb
- Quad-Speed CD-ROM Drive
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- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
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- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS® Office Professional, Bookshelf & Encarta 95
- The Real 3 Year Warranty

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#008778

P5-100 PCI $3299
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- PCI Fast IDE Interface
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- Quad-Speed CD-ROM Drive
- 14.4 Fax Modem with Voicemail
- 3.5" Disk Drive
- 17" .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Microsoft Natural Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Office Professional, Bookshelf & Encarta 95
- The Real 3 Year Warranty

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P5-120 PCI $4999
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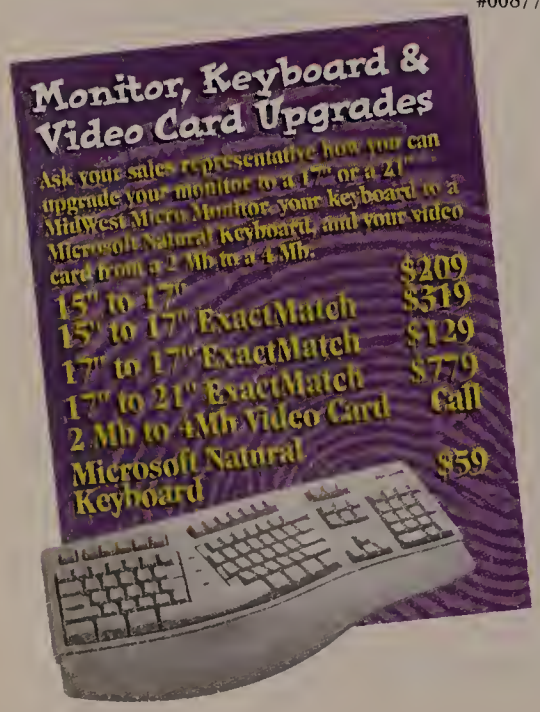

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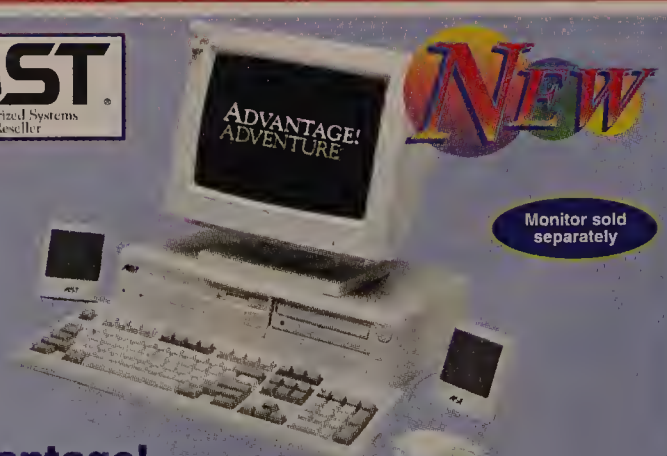

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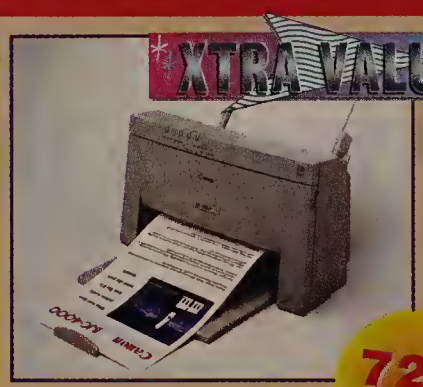

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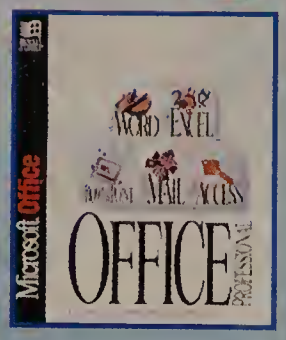

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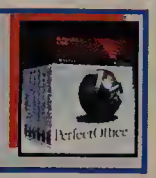

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PT316CTP pocket Token Ring III	455.89
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Jumbo 1400 internal	359.67
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Trakker 350 parallel port	328.91
Trakker 700 parallel port	405.76
Powertape 2.4GB SCSI internal	937.58
Powertape 2.4GB SCSI external	1077.99
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Zip disks 100MB, 3pk	49.95
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Ditto 850MB tape drive internal	217.82
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Bernoulli 230MB Insider SCSI	419.78
Bernoulli 230MB Transportable	454.44
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Advent PP622 spkrs/subwoofer	199.88
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Chinon CDX535 CD-ROM kit external	347.88
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Diamond 5000 Quad CD kit internal	449.86
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NEC 2V Deluxe	285.69
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NEC 3Xp Plus Kit	458.93
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NEC 4Xi Kit	449.76
NEC 4Xe	479.85
NEC 4Xe Kit	549.25
NEC 6Xi	456.14
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Pioneer DRM604X 4X 6 disc	804.71
Pioneer DRM1804X 4X 18 disc	1879.28
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Plextor 4plex quad internal	409.04
Plextor 6X internal	499.87
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Sigma Designs RealMagic	379.89
Sigma Designs RealMagic CD Kit	659.41
Sony CDU-55E 2X internal	119.84
Sony CDU-55S SCSI 2X internal	165.07
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Sun Moon Star CD 2X kit internal w/sound	211.76
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Toshiba 3501 SCSI 4X external	439.48
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- **Optional Multimedia Bundle: $185.00** Includes: 6 Software Titles including 4 CDs, External Speakers & Microsoft Sound System Software

SoundPro CD Dual Scan

DX4™-75 Dual Scan Color, 4MB RAM/340MB HD

$2245

Or Lease For $88/Month*

SoundPro CD Active Matrix

DX4™-75 Active Matrix Color, 4MB RAM/340MB HD

$3145

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Optional Multimedia Bundle – $185.00

Bundle Includes Microsoft Sound System and Portable Speakers Plus Six Software Titles:

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- MS Ancient Lands CD
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SoundPro P-54

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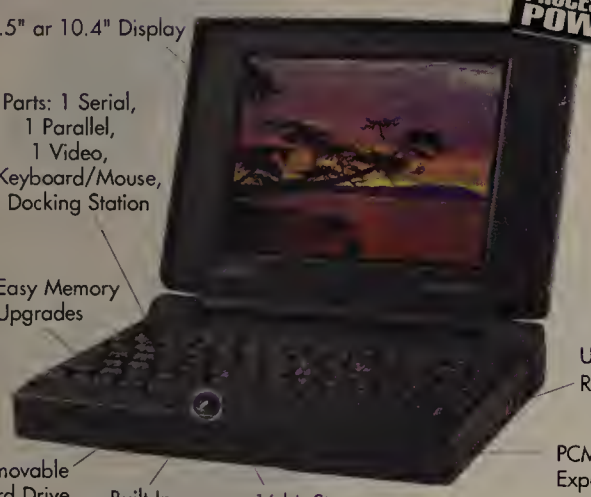

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- Removable Hard Drive Up to 1 Gigabyte Capacity
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- Options: Docking Station, Internal 14.4/14.4 Fax-Modem, Car Adapter, External Battery Charger, Extra Batteries
- **Sound System Upgrade: $125.00**
  Includes: External Speakers & Microsoft Sound System Software

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SoundPro P-54 Active Matrix
Intel Pentium™ P-75 CPU 8MB RAM/340MB HD
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Upgrade to P-90 for $225 or P-100 for $375

SoundPro

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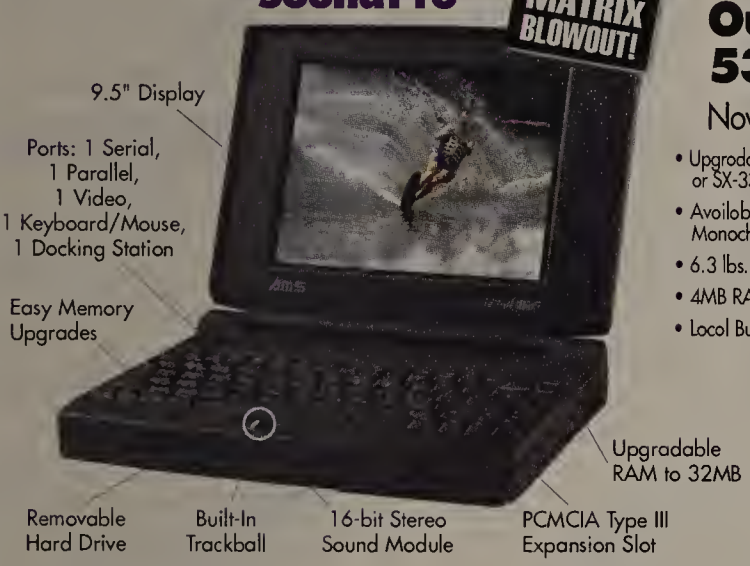

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  Includes: External Speakers & Microsoft Sound System Software

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PC WORLD, April 1995

PC WORLD

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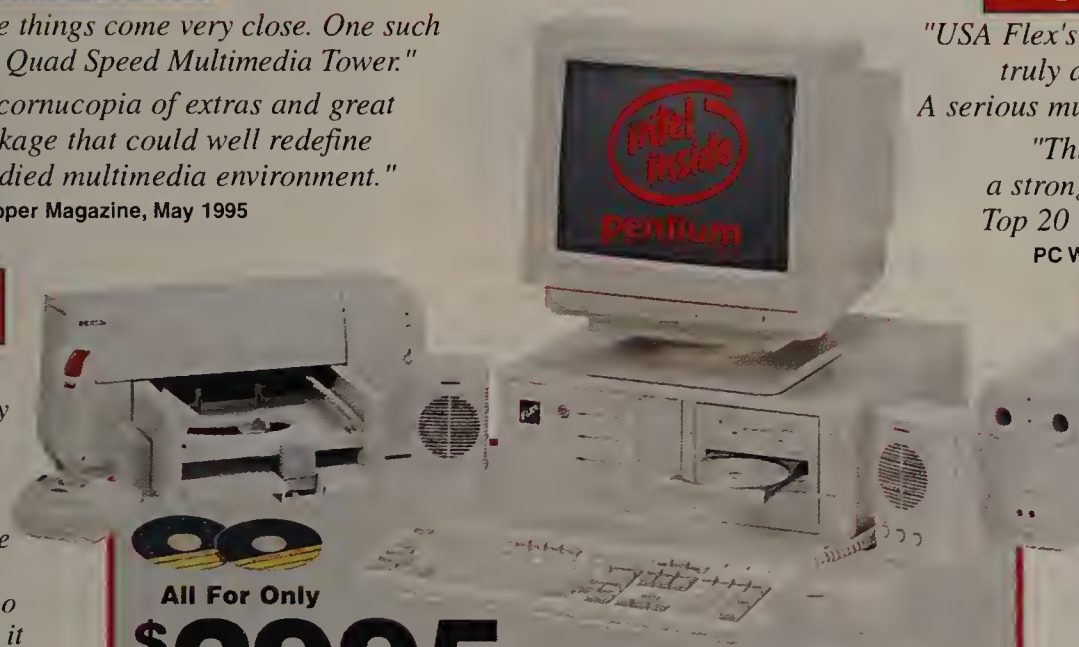

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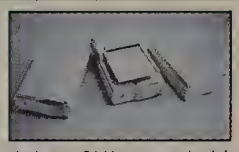

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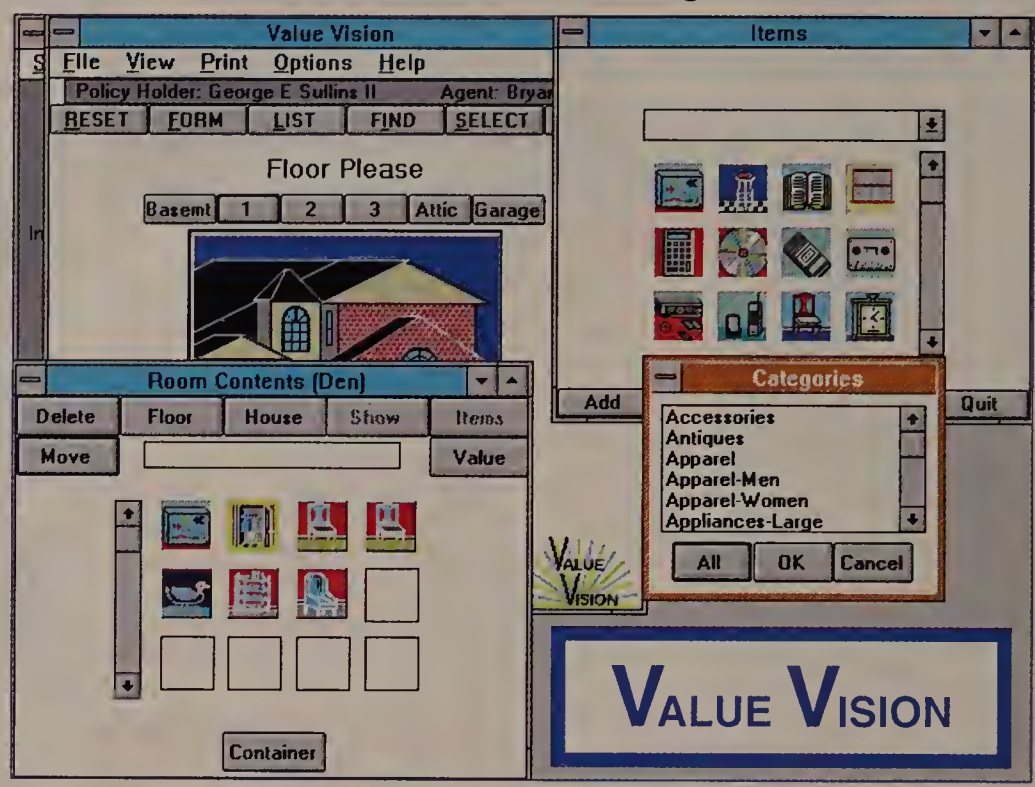

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Premmia MTE 4/33, 4/66d, P/60	32 Meg	501159-004	1149.00
Manhattan G, V Series Server	64 Meg	501159-005	2298.00
Power Premium 3/33, 4/33, 4/33S, 4/50d, 4/66d	8Meg	500780-001	378.00
Premium 486/25, 486/25E, 486/33, 486/33E			} 72 pin
Premium 386/33TE, 486/25TE, 486/33TE			
Prem. II 386/25, 386/33, 486/33, 486 SX/20			
Bravo 486/25, 486/33	2 Meg Kit	500780-005	118.00
Advantage 486/25, 486/33, 486/33P, 486 SX/20			
Premium SE4/22	8Meg Kit	500780-001	378.00
Premium SE 4/50, d, 66d, P/60	1 Meg	500780-003	59.00
Prem. 386/33T, 386 SX16, Prem.II 386SX 20, 386/25	4Meg	500780-004	189.00
Premmia GX P/90, P/100	8Meg Kit/16MegKit	501565-001/501566-001	378/699
	32Meg Kit/64Meg Kit	501567-001/501568-001	958/2298
AST Cupid Board	0-32 Meg	500818-001	179.00

AMBRA

Ambra Pentium-60	4/8/16 Meg	175.00/369.00/599.00
Ambra NC 425SL	2/4/8 Meg	109.00/209.00/449.00
Ambra N Series	4/8/12/16 Meg	189.00/349.00/569.00/679.00
Ambra SN Series	4/16 Meg	189.00/699.00
Ambra Sprinta SLC II	2/8 Meg	89.00/319.00
Ambra N-75, N-100	4/8/16	189.00/369.00/659.00

ZENITH MEMORY MODULES

MODEL	AMT. UPGRADED	AST PART #	PRICE
Z386/33, 25, 20, 33E	1Meg	ZA3800ME	59.00
Z386/33, 25, 20, 33E, 486/25E	4Meg	ZA3800MK	180.00
Z386SX	2Meg	Z-605-1 modules	119.00

MAGNAVOX

286/386SX-16, 386SX-20, 486SX-20 & 386-33 *all are 72PIN SIMM:*
1MEG – 59.00 4MEG – 180.00 8MEG – 349.00 16MEG – 659.00

MEMORY BOARDS
IBM Compatibles & PS/2

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16 BIT MEMORY BO. FOR 286, 386 AT • 0K-8Meg Bd. 4.0 LIM Compat. • New 5 Yr. Warr. Convent., Expnd. & Extnd. Memory • Supports DDS, DS/2, LIM/EMS & EEMS • Versatile Split Memory Addressing • Operates w/CPU Speeds to 33 MHz • Supports Desqview, Multitask operations • ***Bd. made by Boca Research, AT plus***
0K – $84.00 2Meg – $159.00 4Meg – $239.00 8Meg – $399.00

BOCA XT 8 BIT BUS

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0-K – **$99.00** 1Meg **$189.00** 2Meg – **$229.00**

IBM P/S2 32BIT EXPANSION BD.

0-16Meg. Ext.-Expnd. Memory Bd. for P/S2 70, 80, 90, Lim 4.0

DMeg	2Meg	4Meg	8Meg	16Meg
$139.00	$238.00	$319.00	$499.00	$859.00

PS/2 MCA 0-8MEG EXPANSION BD.

0-8Meg Extended and/or Expanded Memory for all IBM P/S2 Models 50, 50Z, 60, 55SX, 65SX, 16 Bit, 4.0 LIM Compat.
0K – **119.00** 2Meg – **199.00** 4Meg – **283.00** 8Meg – **449.00**

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BATTERIES

★ ★ CALL FOR NOTEBOOK AND LAPTOP BATTERIES ★ ★

IBM PS/1, PS/2 MEMORY MODULES

IBM PART NO.	WORKS WITH MODEL NO.	PRICE
30F5348 (512K)	30-286	37.00
30F5360 (2Meg)	30-286, 25-286, 50 MTHR 80.	104.00
6450375 (1Meg)	80-041	79 00
6450379 (2Meg)	80-111, 311-121, 321, 081, 161	84 00
6451060 (4Meg)	80-A21, A-61, 80-A31, 80-111, 80-311	189.00
6450604/92G7196 (2Meg)	70-061, E61, 121, 50Z, 55SX, 65SX, P-70, 55LS, 65LS, X-Station 120 & 130, 35SX, 35LS, 40SX	99.00
6450608 (2Meg)	70-A21, A-61, 8-21, B-61, 35SX, 35LS, 40SX, Val Pt. 325T	90 00
78X8955 (128K)	25	35 00
34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX, 55LS, 85LS	175 00
87F9977/92G7199 (4Meg)	55SX, 55LS, 65SX, 40SX, 35SX, 35LS	175 00
1057035 (512K)	P/S1-286	49 00
92F9935 (2Meg)	P/S1 & P/S1/386SX-2121	109.00
92F9694 (4Meg)	P/S1 & P/S1/386SX, Model-2121	189 00
92G7200 (4Meg)	PSI Expert, Consultant, Willow	175.00
92G7201, 73G3131 (4Meg)	Value Point Performance, PC Server 4/66	175.00
92G7539 (4Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	Call
92G7541 (8Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	Call
92G7543 (16Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	Call
92G7545 (32Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	Call
73G3132/92G7203 (8Meg)	Value Point Performance, PC Server 4/66	339.00
60G1622/92G7204 (16Meg)	Value Point Performance, PC Server 4/66	609 00
92G7205 (32Meg)	Value Point Performance, PC Server 4/66	1239 00
6450902 (2Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC	90 00
6450128/92G7200 (4Meg)	Value Point 77 486OX2, 486SX, SVR 85 57SX, 90, 95, P-75, 57SLC, 56, 56SLC, P/S1, 386SX, Mod-2123, 2133, 2155, Val Pt.77, 486CS2, 486SX, SVR85	175.00
	Value Point 77 486OX2, 486SX, SVR 85	
6450129/92G7428 (8Meg)	35SX, 40SX	339.00
6450130/92G7202 (8Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC	339.00
	Value Point 77 486OX2, 486SX, SVR 85	
6451158/92G7208 (4Meg ecc)	486; 95XP; 95A (install in pairs)	199.00
6451159 (8Meg ecc)	486; 95XP; 95A (install in pairs)	399 00
92G7209/32G3720 (16Meg ecc)	9595 OPT	749.00

IBM NOTEBOOK & LAPTOP MEMORY

07G1415/07G1420 (4Meg)	Thinkpad 750, C, 700, C, 720, C, CL57SX	189.00
07G1416/07G1421 (8Meg)	Thinkpad 750, C, 700, C, 720, C, CL57SX	369 00
66G0095 (16Meg)	Thinkpad 750, C	669.00
66G0094 (4Meg)	Thinkpad 755, 360, 355, 340, 450	179 00
66G0094 (8Meg)	Thinkpad 755, 360, 355, 340, 450	349 00
66G0094 (16Meg)	Thinkpad 755, 360, 355, 340, 450	629.00
8189098 (4Meg)	Thinkpad 500, 510CS (3.3 volt)	209.00
8189099 (8Meg)	Thinkpad 500, 510CS (3.3 volt)	389.00
8189113 (16Meg)	Thinkpad 500, 510CS (3.3 volt)	799.00
79F0999 (2Meg)	LX40, N33SX, PS Note	103.00
79F1000 (4Meg)	LX40, N33SX, PS Note, Tkpd 350, 350c, PS Note 425	189.00
79F1001 (8Meg)	LX40, N33SX, PS Note	349.00
Hard Drive (524Meg, 710 Meg))	Thinkpad 750, 755, 360, 355	949.00/1149.00
(4Meg/16Meg)	Thinkpad 755 Dimm Modules	209.00/699.00
(4Meg/16 Meg w/Adap	Thinkpad 755	289.00/749.00
60G0378 (8Meg)	Thinkpad 350, 350c, PS Note 425	339.00
60G0379 (16Meg)	Thinkpad 350, 350c, PS Note 425	569.00
92F8804 (2Meg)	N45SL	109.00
92G7259 (4Meg)	Thinkpad 701C, CS, Butterfly	Call
92G7261 (8Meg)	Thinkpad 701C, CS, Butterfly	Call
92G7263 (16Meg)	Thinkpad 701C, CS, Butterfly	Call

COMPAQ MEMORY MODULES

MODEL	AMT. UPGRADED	CMPQ PART #	PRICE
OeskPro 386/33, 386/33L,	2Meg Module	115144-001	109.00
486/25, 486/33L.	8Meg Module	116561-001	399.00
486/50L, System Pro	32Meg Module	116568-001	1399.00
OeskPro 386/33L, 486/33L	(Exp Bd)	116569-001	279.00
OeskPro 386/25, 386/20	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
OeskPro 386S-16MHz	1Meg Exp Bd	113633-001	149.00
	4Meg Exp Bd	113634-001	279.00
	1Meg Module	113646-001	79.00
	4Meg Module	112534-001	199.00
OeskPro 386/20E	1Meg Exp Bd	113644-001	149.00
OeskPro 386/25E	4Meg Exp Bd	113645-001	279.00
	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
OeskPro 286N, 386N, 386SX20,	1Meg Module	118688-001	59.00
all "M" series, sytem LT series,	2Meg Module	118689-001	89.00
all "I" series	4Meg Module	118690-001	169.00
	8Meg Module	128877-001	339 00
M Series Exp Bd	0-64Meg	129160-001	189.00
OeskPro 386/16	1Meg Kit	108071-001	99.00
	4Meg Kit	108072-001	299.00
	1-2Meg Exp Bd	108069-001	239.00
	4-8Meg Exp Bd	108070-001	437 00
OeskPro 286 } ALL OF	512K Kit	113012-001	49.00
OeskPro 5/60, 5/66M, 5/66M } THESE	8Meg Kit	149911-001	389.00
Prosignia 5/60 } MACHINES	16Meg Kit	149949-001	599.00
Proliant 100 5/60 } USE	32Meg Kit	149912-001	1356.00
Proliant 2000 4/30, 5/66 } THESE	64Meg Kit	149913-001	2516.00
Proliant 4000 4/50, 5/66 } MODULES	128Meg Kit	149914-001	5799 00
Prolinea 386 3/25S, 3/252S	2Meg	141738-001	90.00
	8Meg	141742-001	316 00
Prolinea 486 4/25S, 4/33, 4/50, 4/66, COS	2Meg	141683-001	95.00
Enhanced Prolinea, Prosario series	4Meg	141684-001	175.00
	8Meg	141685-001	339 00
Prosignia PC Server, 486/33,	8Meg	141685-001	339 00
486 DX2/66	16Meg	149320-001	599.00
	32Meg	149147-001	1199.00

COMPAQ LAPTOPS & NOTEBOOKS

LTE/286	4Meg 8d	117081-003	179.00
LTE/386S/20	4Meg Module	121125-002	209.00
LTE LITE/20, 25, 25C	4Meg Module	129769-002	209.00
LTE LITE/20, 25, 25C	8Meg Module	129769-003	389.00
LTE LITE/20, 25, 25C	16Meg Module	129769-004	769.00
LTE LITE 425C/33C/25E/25L	4Meg Module	142337-002	189.00
LTE LITE 425C/33C/25E/25L	8Meg Module	142337-003	329.00
LTE LITE 425C/33C/25E/25L	16Meg Module	142337-004	639.00
SLT/286	4Meg Module	110237-001	199.00
SLT/386	2Meg Module	118304-001	109.00
SLT/386	4Meg Module	118305-001	219.00
Concerto, LTE Elite	4Meg	144790-001	189 00
	8Meg	144790-002	369.00
	16Meg	144790-003	699.00
Contura 320, 325	2Meg	139497-001	99.00
	4Meg	139498-001	189 00
	8Meg	139499-001	339 00
Contura 400, 410	4Meg/8Meg/16Meg		199/389/709
Contura 4/25, 4/25C, 4/25CX	4Meg	146520-001	189 00
	8Meg	146521-001	339 00
	16Meg	146531-001	899.00
Aero 4/25, 4/33L	4Meg	190532-001	184 00
	8Meg	190597-001	359 00

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TOSHIBA LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
T2000SXE/2200SX/T1800, 1850, C	2Meg	PC-PA2000U	89 00
T2000SXE/2200SX/T1800, 1850, C	4Meg	PC-PA2001U	189.00
T2000SXE/2200SX/T1800, 1850, C	8Meg	PC-PA2002U	359 00
T2100, 2105, 2150	4Meg/8Meg		199/389
T2100, 2105, 2150	16Meg/24Meg		729/1249
T4400SX, SXC T6400, T6600	4Meg	PC-PA2004U	189 00
T4400SX, SXC T6400, T6600	8Meg	PC-PA2005U	359 00
T4400SX, SXC T6400, T6600	16Meg	PC-PA2010U	689.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3 3 v)	4Meg	PC-PA2012U	199 00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3 3 v)	8Meg	PC-PA2013U	389 00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3 3 v)	16Meg	PC-PA2014U	769 00
T4700, 4800, 4850 (Hard Drive)	524Meg/710Meg		949/1149
T3400CT, T2400, T3600	4Meg	PC-PA2019U	194 00
T3400CT, T2400, T3600	8Meg	PC-PA2020U	359 00
T3400CT, T2400, T3600	16Meg	PC-PA2021U	707 00
T3400CT	32Meg		1549 00
T3100SX	2Meg	PC15-PA8308U	55 00
T3100SX	4Meg	PC15-PA8310U	189 00
T3200	3Meg	PC6-PA7137U	110 00
T3200SX	2Meg	PC12-PA8307U	55 00
T3200SX	4Meg	PC12-PA8909	199 00
T5200/T8500	2Meg	PC10-PA8304U	114 00
T5200/T8500	8Meg	PC10-PA8313U	419 00

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
ACER 730, 735C, 780, 780	2Meg/4Meg/8Meg		109/209/399
ACER 750	4Meg/8Meg/16Meg		199/459/799
ALR Venture	4Meg	12407980	249.00
Altima Virage	4 Meg/ 16 Meg		199/679
Altima Virage II	4Meg/8Meg/16Meg		199/389/679
AST Ascentia 900N, 800N	4Meg/8Meg/16Meg		199/379/679
AST Bravo & Explorer	4Meg/16Meg	501255-001, -002	189/679
AST Notebook Prem Exec 386SX/20/25/25L	4Meg	500814-003	189 00
AST Power Exec 3/25C, 425L, 425SL	4Meg/16Meg	501166-001, -003	199/699
AST Power Exec 4/33SL	4Meg/16Meg	501318-001,002	194/769
AT&T Globalyst 200	4Meg/8Meg/16Meg		199/389/679
AT&T Safari NSX/20	4Meg	PEC 37651	259.00
Austin DX4, DX2, SX2, SX Series	4Meg/16Meg		Call
Bondwell B310, Plus	1Meg	23050-09100	69 00
Bondwell B310V, SX	1Meg		109 00
Bondwell B310V, SX	4Meg		229 00
Canon Innova Book 150	4Meg/16Meg		199/769
Canon Innova 486	2Meg/4Meg/8Meg		109/209/449
Canon Innova 486-10	4Meg/16Meg		189/829
Canon Notejet 486	4Meg/ 8 Meg		199/389
Chaplet 486	4Meg/16Meg		199/679
Chicony N85	4Meg/16Meg		199/679
Compuadd 425TX Notebook	4Meg/16Meg		Call
OEC HiNote	4Meg/8Meg/16Meg		199/379/669
Dell Lattitude M, MC, MCX	4Meg/8Meg/16Meg		219/449/719
Dell Lattitude XP, 475, 4100, 4100CX	4Meg/16Meg		199/649
Dell Latitude 486, 425, 433C, 433CX, 450, 450CX	4 Meg/16 Meg		199/679
DTK 4T100P Notebook	4Meg/8Meg/16Meg/32 Meg		Call
Epson ActionNote 650, 650c	4Meg/8Meg/16Meg		209/399/659
Epson ActionNote 700, 700c, 700cx	4Meg/16Meg		199/639
Epson ActionNote 4000 Notebook	6Meg		Call
Epson ActionNote 4LC/25, 4LC/33, 4SLC/2-50			Call
Everex Tempo LX, LX20, Carrier	2Meg	PCA 00053-0001	109 00
Gateway 2000 Colorbook 4/33	4Meg/16Meg		199/679
Gateway 2000 Nomad 425 OXL/SXL	4Meg/16Meg		199/1199
Gateway 2000 486 Handbook	4Meg/16Meg		199/679
Goldstar GS520 386SX/16	4Meg	S386-4M	249 00
Grid 1720, 1750, 1755	1Meg		59.00
HP Omnibook 300, 480, 425	2Meg/4Meg		129/269
HP Omnibook 530, 600	4Meg/8Meg/12Meg		229/439/769
HP Omnibook 4000	4Meg/8Meg/16Meg		199/379/649
Leading Edge Aviva	4Meg/16Meg		199/679
Lexmark SE10	4Meg/8Meg		209/399
Magnavox Metalis	1Meg/4Meg	286, 386SX	109/199
Midwest Micro Elite SX-25, SX33, DX2-50, 0X2-66	4Meg/8Meg/16Meg		199/389/679
Midwest Micro Elite 486 SLC 33 Subnotebook	4Meg/8Meg/16Meg		199/199/299
Midwest Micro Elite Sndbk SX33, DX3-50, DX4-75, DX4-100	4Meg/8Meg/16Meg		199/389/679
Midwest Micro Elite Sndbk Plus 05-75, 05-90	4Meg/8Meg/16Meg		199/389/679
NCR Safari 3180	4Meg/ 8 Meg		239/449
NEC Prospeed 386	2Meg	PC31-21	119 00
NEC Prospeed 386	8Meg	PC31-22	399 00
NEC Prospeed 286, 386SX-16, 386SX-20	4Meg	PC21-22, PC43-22	199 00
NEC Ultralite Versa, E, V	4 Meg/8Meg/16Meg/20Meg	OP4104	183/359/739/919
NEC Versa Removable Hard Drive	340Meg/524Meg/710Meg		749/899/1049
NEC Versa S	4Meg/8Meg/16Meg		209/379/799
Packard Bell 386SX, 286	1Meg, 4Meg	286, 386SX	109/199
Packard Bell Statesman	2Meg/8Meg		119/369
Panasonic CF170, CF270, CF370	1Meg	CF-BA165	59 00
Panasonic CF380, CF480	2Meg/4Meg/6Meg		119/199/309
Panasonic CF-V21P, CF-580	4Meg/16Meg		219/819
Sanyo 17/18 NB	2Meg	MBC-NBMEM2	109 00
Sharp 6781, 6881, 6785, 6700, 6800, 6741	2Meg/4Meg		109/199
Sharp 9150, 9650, 8660, 7700, 7760	4Meg/16Meg		199/679
Sharp 8700 & 8900	4Meg/8Meg/16Meg		199/379/649
Sharp PC-6220	1Meg	CE 621B	79 00
Ti Travelmate 2000	1Meg	2568034-0001	79 00
Ti Travelmate 3000	2Meg	2566996-1	84 00
Ti 4000, Ti 4000E	4Meg/16Meg		199/859
Ti 4000M	4Meg/16Meg		219/799
Tandy 1510, 2810, 3810	1Meg		49 00
Tandy 2820, 3820, 3830	2Meg/4Meg/6 Meg		119/199/309
Twinhead, Altima, Compudyne, 486SX, 0X Tandy 4860	4Meg/16Meg		199/679
Twinhead Slimnote 5	4Meg/8Meg/16Meg		199, 379, 649
Ultra 486 TS38	4Meg/8Meg/16Meg		249/459/899
Zeos 386SX Notebook (not the + version)	2Meg		109 00
Zenith Master Sport 386SX	2Meg	ZA-300-1	114 00
Zenith Master Sport SL, SLE, 600, 820, 625NL	2Meg	ZA-4-4	119 00
Zenith Super Sport 286, 286E	1Meg	ZA-180-66	99 00
286E, SX	2Meg	ZA-180-64	149 00
SX Alpha/SX Beta	2Meg	ZA-180-86/ZA-180-87	149 00
Zenith Z-Note 425LN, LNC, LNP	4/8/16Meg		209/469/939
Zenith Z-Star 4/33	2/8Meg		119/369

PCMCIA VERSION 2.0 (for Palmtop & Subnotebooks)

MODEL	PRICE	MODEL	PRICE
S-RAM Cards 1MEG	159	5250 IBM Emulatin Card	495
S-RAM Cards 2MEG	229	Bus Toaster (High speed SCSI II)	199
28.8/28.8 Data/Fax Modem	379	CD-Rom/SCSI	299
14,400/14,400 Data/Fax Modem	189	Wavjammer™ (16 bit stereo sound card)	275
Readwriter Card (15A Slot)	149	Multimedia Combo, Sound/SCSI	499
Lan Ethernet Combo	Call	Type III 105 Mg Hard Drive	319
Lan Ethernet (10 Base T)	169	Type III 130 Mg Hard Drive	399
Lan Ethernet (Coax)	169	Type III 170 Mg Hard Drive	439

FLASH MEMORY 2.5Meg–219.00 5 Meg–299.00 10Meg–459.00 20Meg–749.00

LASER PRINTER MEMORY UPGRADES

AMOUNT UPGRADED	OK 8d	256k	1	2	3	3.5	4	5	6	8	16	32
Brother 630, 631, 641, 645	–	–	89	135	–	–	–	–	–	–	–	–
Canon LBP 430	–	–	69	–	1Meg	–	189	–	–	–	–	–
Canon LBP 860	–	–	–	99	–	–	179	–	–	349	669	1249
Canon LBP4, 4Lite, 4plus	–	–	159	219	–	–	–	–	–	–	–	–
Epson 6000, Action Laser	–	–	–	139	–	–	229	–	–	–	–	–
Epson Action Laser 1100, 1600	–	–	69	99	–	–	189	–	–	379	599	–
Epson Action Laser II	–	–	89	–	208	–	–	327	–	–	–	–
Epson 8000, 1800, 4000, 4100, 4300	–	–	89	–	208	–	–	327	–	Call	Call	Call
Epson 1000, 1500, 5000, 5200	–	–	–	***119***	–	–	***238***	–	***Call***	–	–	–
HP 2, 2D	–	–	–	109	–	–	189	–	–	–	–	–
HP 3, 3D, 3P, 2P 2P+	–	–	–	99	–	–	169	–	–	–	–	–
HP 4, 4M 4Si, 4SiMX, 4P, 4MP	–	–	–	89	–	–	189	–	–	349	–	–
HP 4L	–	–	59	–	–	–	–	–	–	–	–	–
HP 3SI	–	–	69	–	–	–	189	–	–	349	–	–
HP 4SI	–	–	–	89	–	–	175	–	–	349	–	–
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HP Deskjet 500, 500C, 510, 550,560	–	55	–	–	–	–	–	–	–	–	–	–
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HP Paintjet XL300	109	–	–	–	–	–	289	–	–	469	837	–
IBM Laser 4019, 4019E	–	–	–	–	–	169	–	–	–	–	–	–
IBM Laser 4029, 4037	–	–	–	–	–	–	189	–	–	–	–	–
IBM Laser 4039, 4079	–	–	–	99	–	–	169	–	–	350	–	–
Konica LP-3110	–	–	119	189	239	–	–	–	–	–	–	–
NEC 90, 290	–	–	–	139	–	–	–	–	–	–	–	–
NEC 95, 97	–	–	–	99	–	–	–	–	–	–	–	–
Oki 400	–	–	–	84	–	–	–	–	–	–	–	–
Oki 400E, 400EX, 410E, 410EX	–	–	135	189	–	–	–	–	–	–	–	–
Oki 830, 840	–	–	–	109	–	–	–	–	–	–	–	–
Packard Bell PB 9500	–	–	–	139	–	–	227	–	–	–	–	–
Packard Bell 9615	–	–	–	159	–	–	269	–	–	–	–	–
Panasonic 4420/4450I	–	–	–	129	–	–	229	–	–	–	–	–
Panasonic 4410/4430	–	–	–	126	–	–	195	–	–	–	–	–
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TI XL/PS17/PS35	–	–	55	–	–	–	–	–	–	–	–	–
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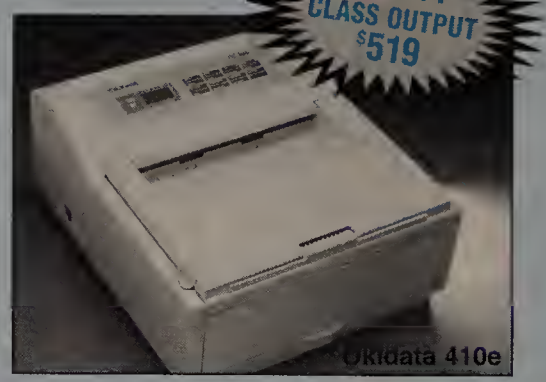

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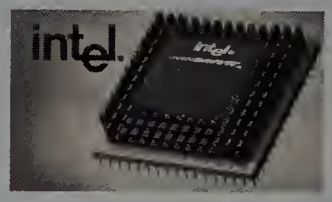

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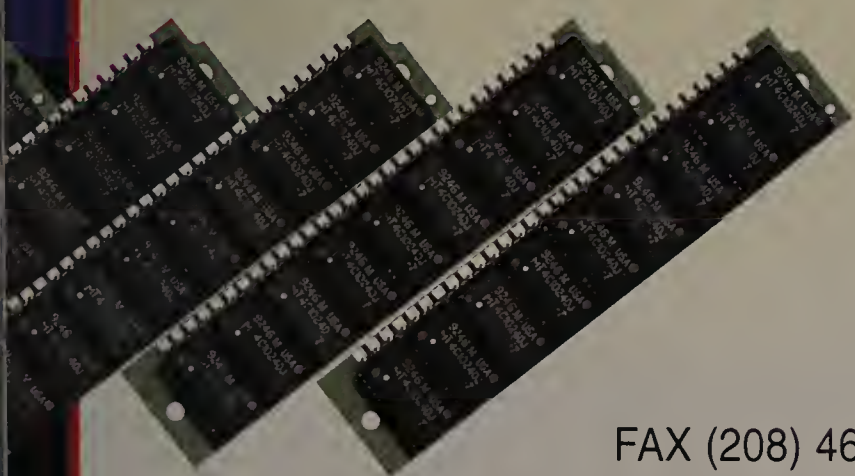

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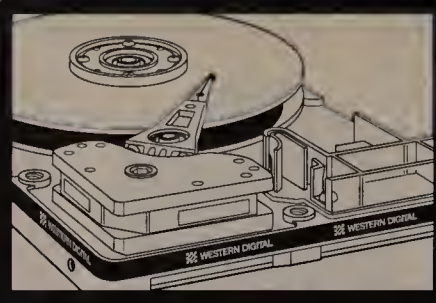

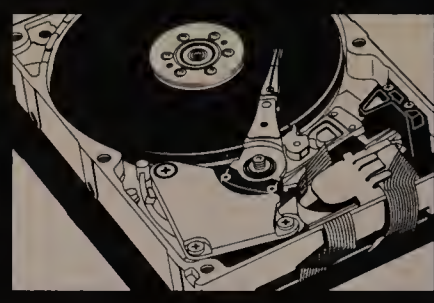

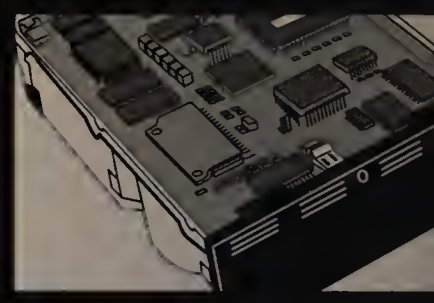

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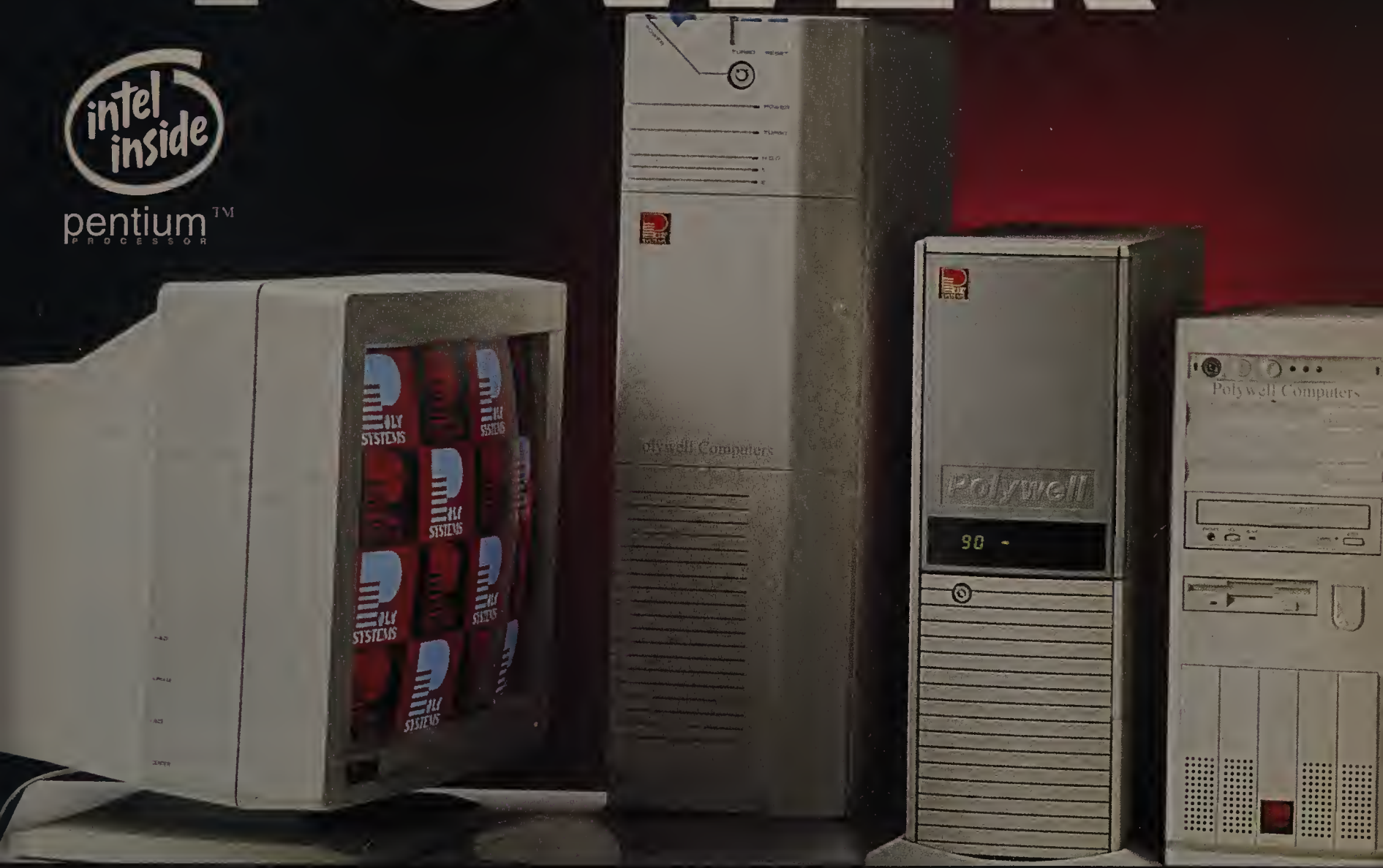

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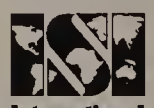

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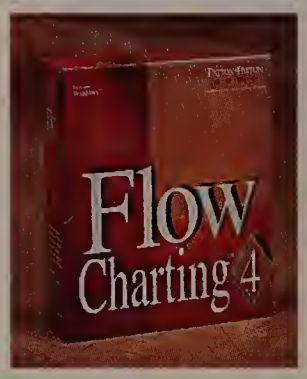

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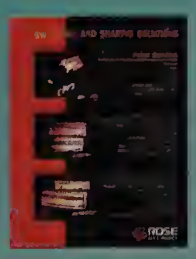

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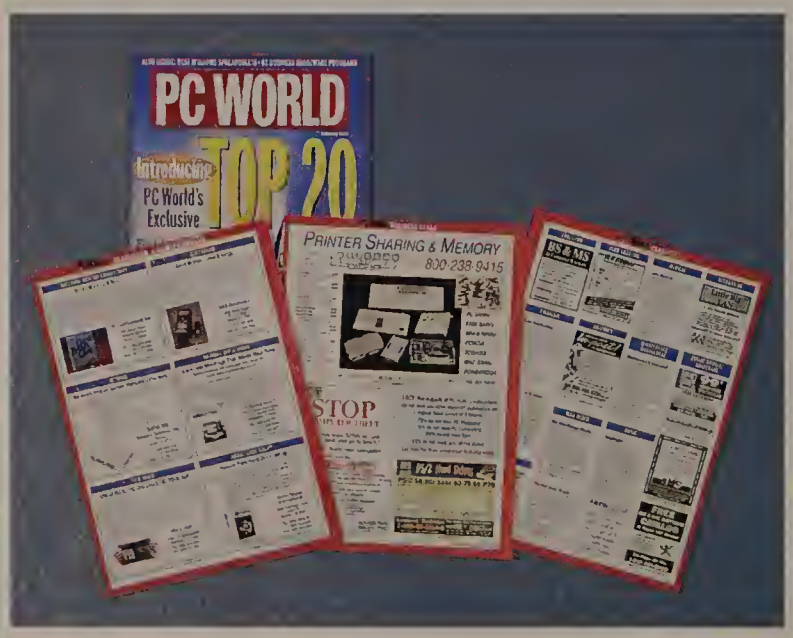

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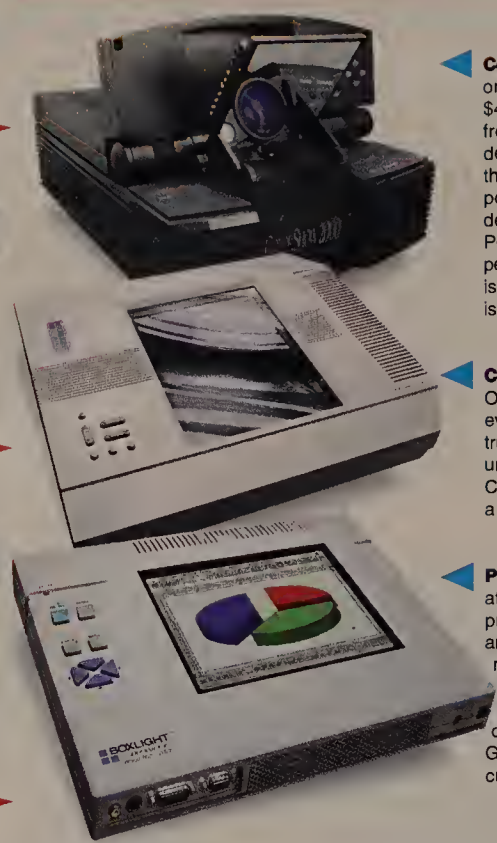

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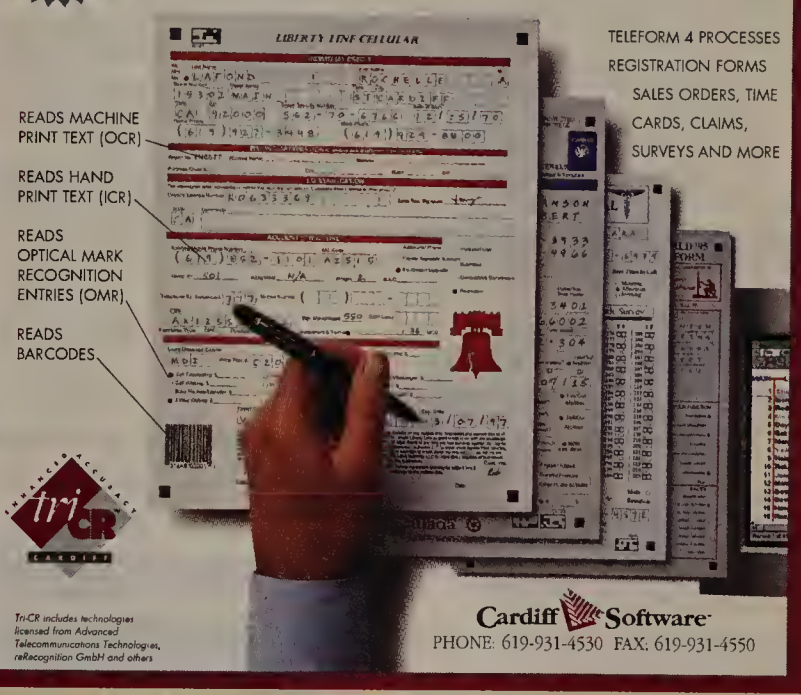

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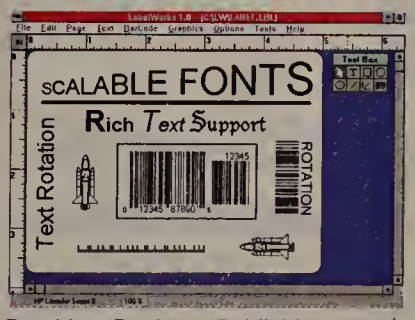

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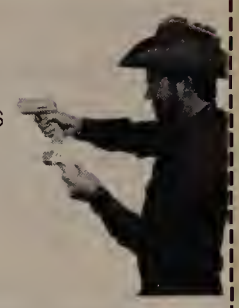

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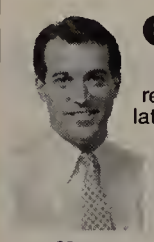

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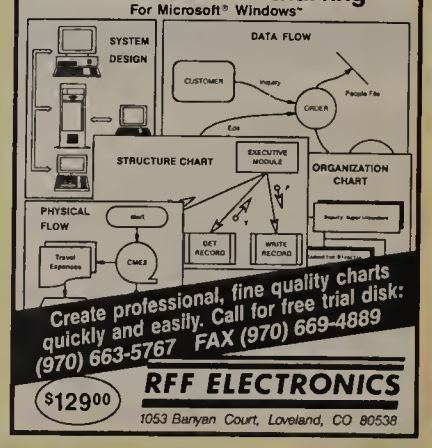

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In re INTEL PENTIUM™ PROCESSOR LITIGATION

This Document Relates To: All Actions

) Master File No. 745729
)
) SUMMARY NOTICE OF
) SETTLEMENT OF CLASS
) ACTION
)

TO: ALL PERSONS IN THE UNITED STATES, WHEREVER LOCATED, WHO ARE EITHER USERS OR END-USERS OF COMPUTERS CONTAINING THE PENTIUM® PROCESSOR:

THE PURPOSE OF THIS SUMMARY NOTICE IS TO INFORM ALL CLASS MEMBERS OF A PROPOSED SETTLEMENT OF THIS LITIGATION AS EXPLAINED IN DETAIL IN A NOTICE OF SETTLEMENT OF CLASS ACTION WHICH YOU ARE ENCOURAGED TO READ IN ITS ENTIRETY. IF YOU PURCHASED OR OTHERWISE USED A COMPUTER CONTAINING A PENTIUM® PROCESSOR, YOU MAY BE A MEMBER OF THE CLASS AND YOUR RIGHTS WILL BE AFFECTED BY LEGAL PROCEEDING IN THIS ACTION.

THE NOTICE OF SETTLEMENT OF CLASS ACTION DESCRIBES THE CLAIMS AND PROCEEDINGS INVOLVED IN THE ABOVE-CAPTIONED ACTION AND THE TERMS OF THE SETTLEMENT SET FORTH IN A STIPULATION OF SETTLEMENT AGREED TO BY THE PARTIES ON MARCH 21 (THE "SETTLEMENT STIPULATION").

YOU ALSO HAVE A RIGHT TO BE EXCLUDED FROM THE CLASS AS DETAILED IN THE NOTICE OF SETTLEMENT OF CLASS ACTION. IF YOU WISH TO BE EXCLUDED FROM THE CLASS YOU MUST FOLLOW THE PROCEDURES OUTLINED HEREIN.

IF YOU DO NOT REQUEST EXCLUSION FROM THE CLASS AND THIS SETTLEMENT BECOMES EFFECTIVE YOU WILL BE GIVEN CERTAIN RIGHTS IN EXCHANGE FOR THE RELINQUISHMENT OF CERTAIN CLAIMS. THAT PROCEDURE WILL NOT GIVE YOU THE RIGHT TO A TRIAL ON SUCH CLAIMS AND YOU WILL WAIVE YOUR RIGHT TO A TRAIL ON SUCH CLAIMS.

AS PART OF THE SETTLEMENT, A MECHANISM WILL BE ESTABLISHED TO RESOLVE CLAIMS FOR CERTAIN TYPES OF OUT OF POCKET EXPENSES. THIS MECHANISM IS THE EXCLUSIVE MEANS TO PURSUE SUCH CLAIMS. IF YOU DO NOT PURSUE SUCH CLAIMS THROUGH THAT MECHANISM, YOU WILL BE BARRED FROM PURSUING SUCH CLAIMS. IF YOU PURSUE SUCH CLAIMS THROUGH THAT MECHANISM YOU WILL NOT BE GIVEN A TRIAL ON THOSE CLAIMS.YOUR CLAIMS WILL BE DECIDED BY A SETTLEMENT ARBITRATOR.

If you properly request exclusion from the Settlement Class,the terms of settlement will not be binding as to you.

NOTICE IS HEREBY GIVEN, pursuant to California Code of Civil Procedure § 382 and California Civil Code § 1781 and an Order of the Superior Court of the State of California for the County of Santa Clara dated March 24, 1995, that a hearing will be held before the Honorable Alden Danner in Department 15 at 191 North First Street, San Jose, California at 9:00 a.m. on June 22, 1995 (the Settlement Hearing") to determine: (1) whether the proposed settlement (the "Settlement") of the above-captioned litigation (the "Consolidated Action") as set forth in a Stipulation of Settlement dated March 21, 1995 (the "Settlement Stipulation") is fair, reasonable and adequate; (2)whether a final judgment should be entered dismissing the Consolidated Action on the merits as to Intel with prejudice to Plaintiffs and all members of the Settlement Class who do not request exclusion; and (3)whether applications to be made by the attorneys for Plaintiffs and the Settlement Class for payment of fees and reimbursement of expenses should be approved by the Court.

In brief, the Settlement Stipulation provides for Intel to:

1. Exchange, upon request, the current version of the Pentium® processor for an updated version in which the FPU Imperfection (as defined in the Settlement Stipulation) is corrected, free of charge during the life of the computer, by calling 1-800-628-8686;

2. Maintain I-800 numbers for ordering replacement processors, providing information and resolving problems, including information about how to obtain a replacement processor, the status of the request, and instructions on how to replace the processor;

3. Contract for Local Service Centers nationwide that will provide for trained technicians who will install replacement Pentium® processors (information about locations of the nearest Local Service Center can be obtained by calling 1-800-628-8686);

4. Make available a computer program that will determine whether a Pentium ® processor has the FPU Imperfection in the floating-point divide unit (information about how to obtain a copy of this program may be obtained by calling 1-800-628-8686 or on Intel's Home Page on the World WideWeb (http: / / www.intel.com.) ; and

5. Establish a mechanism to resolve claims for Out of Pocket Expenses (as that term is defined in Exhibit B to the Notice of Settlement of Class Action), which will provide for written claims to be filed with Intel, and if not resolved with Intel, for resolution of the claim by an Arbitrator, at no cost to the claimant (although the arbitrator can asses some fees if the claim is found to be frivolous).

The above is only a short summary of the proposed settlement, all of which is discussed more fully in the detailed printed Notice of Settlement of Class Action. If you are a member of the Settlement Class and desire addtitional information or a detailed printed Notice of Settlement, you may obtain such information or copies by calling Intel at 1-800-628-8686 and asking for a copy to be mailed to you. In addition, a full copy of the Notice of Settlement is available at Intel's Home Page on the World Wide Web (http: / /www.intel.com.). You may also obtain a copy by writing to either Class Counsel at the following addresses:

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ALL QUESTIONS RELATING TO THE PROPOSED SETTLEMENT SHOULD BE DIRECTED TO CLASS COUNSEL. PLEASE DO NOT CONTACT THE COURT OF THE CLERK'S OFFICE FOR INFORMATION.

Dated: April 14, 1995 by Order of the Superior Court of the State of California for the County of Santa Clara.

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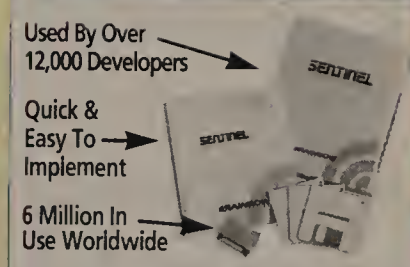

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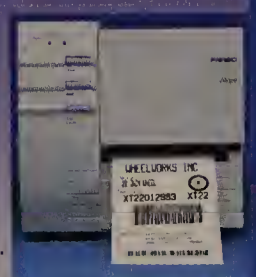
- For IBM or Mac Computers
- 150 to 600 foot Range
- 16 Selectable Frequencies
- No License Required
- 2 way RS-232 Communication
- Kybrd, Wand, Laser or CCD
- 1-16 Terminals/Base Station
- 6.3" x 3.3" x 1.25", 12 oz.
- Base Station – **$740**
- Complete Terminal – **$1095**

Thermal Transfer Printers



- 2" per second Thermal Transfer – Up to 4" wide
- Supports all Popular Bar Codes; 1 year Warranty
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- Small size, Weighs 20 lbs.
- Complete with labels, ribbon, cable, LabelRIGHT DOS software, and Datamax Allegro Printer – **$1895**

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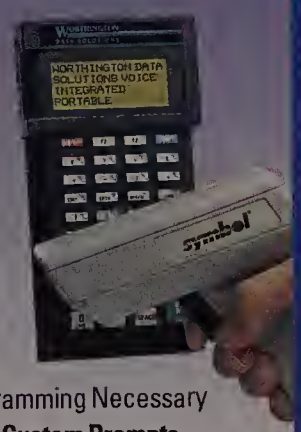
for PC, Mac and Serial

With Voice!



- Battery Operated Reader – 64K or 256K
- Attaches as 2nd Keyboard or Serial
- Display messages & voice messages prompt operator.
- Pick lists, tables.
- Wand, CCD or Laser Scanner
- UPC/EAN, 128, 2of5, MSI, Code 39, etc.
- Date/time stamps
- Built-in Inventory Programs -No Programming Necessary
- **Very Easy to Create Custom Prompts**
- Small Size-Weighs Only 12.5 oz.
- 64K Unit Complete with Wand & Voice – **$799**
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Bar Code Readers
for PC, XT, AT, PS/2, Mac and RS-232 Terminals

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- Allows recurring transactions.
- Prints user-defined or plain paper statements.
- Handles cash receipts or partial payments.
- Ages receivables with user-defined periods.
- Prints mailing labels, 1 to 4 across.
- Payments can apply to up to 250 invoices.
- Provides aged reports by payment date.
- Customer file show: Credit limit, collection status, finance charge, YTD charges and YTD payments.
- Reports can be sorted by: customer number, customer name, customer type, zip code, salesperson code or biller code.

ACCOUNTS PAYABLE

- Prints checks.
- Calculates early payment discounts.
- Ability to distribute to 250 G/L expense accounts per invoice.
- Cash flow analysis/forecast.
- Allows entry of prepaid invoices to be expended later.
- Prepares check register of all payment transactions.
- Accounts for prepaid expenses (i.e. insurance).
- Allows immediate checks (handwritten or printed).
- Provides aged reports by payment date.
- Prints 1099's miscellaneous.
- Checks for duplicate transactions.
- User can define up to nine check formats.

ORDER ENTRY

- Allows adding stock items and customers on the fly.
- Allows real-time update of inventory.
- Invoice for sales and/or service (allows billing for non-stock, special order items).
- Complete detail sales reports with user-defined sorts.
- Hold order feature (quotes on unfilled orders).
- Allows customer credit limits and alerts to exceeded limits.
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- Produces back-order report by customer.
- Displays customer balance during invoicing.
- Allows recurring invoices.
- Allows price-level lookup during invoicing.
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- Add vendors and inventory on the fly.
- Generates purchase orders from understock inventory items.
- Tracks multiple vendors for each stock item.
- Lists economical order quantity.
- Allows reprinting of purchase order.
- User-defined purchase order formats.
- Tracks promised date vs. actual date; quoted cost vs. actual cost.

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Processor	Screen	HD	Price
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4B6DX2/66	10.4" Dual Scan	340MB	2109
486DX2/66	10.4" Dual Scan	510MB	2259

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486DX4/75	10.3" Dual Scan	510MB	2749
4B6DX4/75	10.4" Active	510MB	3829
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4B6DX4/100	10.4" Dual Scan	540MB	4449
4B6DX4/100	10.4" Dual Scan	810MB	4B99
4B6DX4/100	10.4" Active	340MB	4999
486DX4/100	10.4" Active	540MB	5349
4B6DX4/100	10.4" Active	B10MB	5799
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4B6DX2/50	9.5" Dual Scan	540MB	3049
4B6DX2/50	B.4" Active	340MB	3099
4B6DX2/50	B.4" Active	540MB	3449

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IBM ThinkPad® 701			
4B6DX2/50	10.4" Dual Scan	360MB	$3799
4B6DX2/50	10.4" Dual Scan	540MB	4149
4B6DX2/50	10.4" Active	360MB	4799
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4B6DX4/75	10.4" Dual Scan	360MB	4399
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4B6DX4/75	10.4" Active	360MB	5299
4B6DX4/75	10.4" Active	540MB	5649

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LTE Elite

- 10.4" Active Matrix display
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Processor	Screen	HD	Price
4B6DX4/75	9.5" Dual Scan	340MB	$3129
4B6DX4/75	9.5" Dual Scan	510MB	3499
4B6DX4/75	10.4" Active	510MB	5029
4B6DX4/75	10.4" Active	B10MB	53B9

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Processor	Screen	HD	Price
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4B6DX2/50	B.4" Active	350MB	2B39

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Processor	Screen	HD	Price
HP OmniBook 600 Notebook PC			
4B6DX2/50	B.5" Dual Scan	170MB	$2549
4B6DX2/50	B.5" Dual Scan	260MB	2829
486DX4/75	8.5" Dual Scan	170MB	3099
486DX4/75	B.5" Dual Scan	260MB	3379

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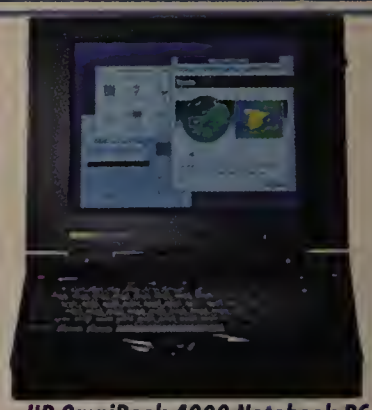
HP InkJet Printers

HP DeskJet 320 (portable) printer	$299.99
HP DeskJet 320 printer w/feeder	359.99
HP DeskJet 540 printer	2B9.99
HP DeskJet 560C printer	479.99
HP DeskJet 1200C printer	979.99
HP OfficeJet	769.99



HP OmniBook 4000 Notebook PC

HP OmniBook 4000

- 10.4" Active & 10.3" Dual Scan
- Built-in 16-bit sound, microphone & speak
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- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
4B6DX2/50	10.3" Dual Scan	260MB	$2499
486DX2/50	10.3" Dual Scan	340MB	2829
4B6DX2/50	10.3" Dual Scan	520MB	3199
4B6DX2/50	10.4" Active	340MB	3769
4B6DX2/50	10.4" Active	520MB	4129
4B6DX4/100	10.3" Dual Scan	340MB	3619
4B6DX4/100	10.3" Dual Scan	520MB	3999
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Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	500MB	$3539
486DX4/75	10.4" Active	500MB	4679

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T4900

T4900CT

- 75MHz Pentium - for blazing performance
- 10.4" Active Matrix display
- Built-in 16-bit sound, microphone, speaker & MIDI

Processor	Screen	HD	Price
Pentium 75	10.4" Active	772MB	$5499

T2100

T2100

- Integrated Accupoint - small, accurate & easy to use
- Built-in AC adapter - small, sleek design & reduced weight
- 10.4" Dual Scan display

Processor	Screen	HD	Price
486DX2/50	9.5" Mono	250MB	$1439
486DX2/50	10.4" Dual Scan	330MB	2249
486DX2/50	8.4" Active	330MB	3099

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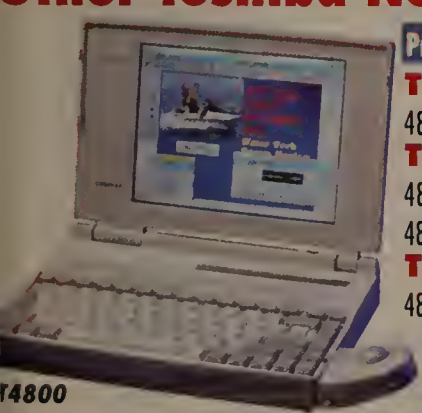

T4800

Processor	Screen	HD	Price
T4800CT			
486DX4/75	9.5" Active	500MB	$3559
T4850CT			
486DX4/75	10.4" Active	500MB	$3889
486DX4/75	10.4" Active	772MB	4099
T3600			
486DX2/50	8.4" Active	500MB	$3719

T3600

$3719

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Versa P

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- Removable/Reversible display
- Replace floppy w/ 2nd battery for 6-10 hrs. battery life
- Replace floppy w/ Versa Bay - Add extra PCMCIA
- Built-in 16-bit sound, microphone & speaker
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
Pentium 75	9.5" Active	340MB	$4349
Pentium 75	9.5" Active	540MB	4629
Pentium 75	9.5" Active	810MB	4999
Pentium 75	9.5" High Res.	540MB	4999
Pentium 75	9.5" High Res.	810MB	5389
Pentium 75	10.4" Active	540MB	4999
Pentium 75	10.4" Active	810MB	5389
Pentium 75	10.4" High Res.	810MB	5769

Versa M

- High Res. displays available - 800x600 res. on notebook
- True color displays available-16.7 million colors on notebook
- Removable/Reversible display
- Replace floppy w/ 2nd battery for 6-10 hrs. battery life
- Replace floppy w/ Versa Bay - Add extra PCMCIA
- Built-in 16-bit sound, microphone & speaker
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
486DX4/75	9.5" Dual Scan	250MB	$3049
486DX4/75	9.5" Dual Scan	340MB	3119
486DX4/75	9.5" Active	340MB	3739
486DX4/75	9.5" Active	540MB	3999
486DX4/75	9.5" True Color	340MB	3999
486DX4/75	9.5" High Res.	540MB	4399
486DX4/100	9.5" Active	340MB	4069
486DX4/100	9.5" True Color	540MB	4629
486DX4/100	9.5" Active	810MB	4729
486DX4/100	9.5" High Res.	540MB	4729
486DX4/100	9.5" High Res.	810MB	5099

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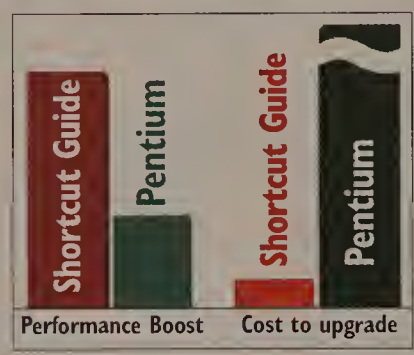

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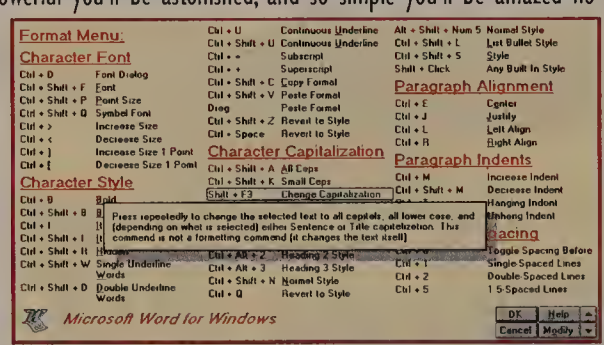

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

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601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

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901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920

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951 Desktop computers
952 Notebook computers
953 DTP/Presentation software
954 Monitors and video boards
955 Accounting software
956 Draw/paint software
957 Network/sharing products
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959 Multimedia products
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

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621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

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901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920

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951 Desktop computers
952 Notebook computers
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958 Printers
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

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641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
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861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

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Editorial Features (see article for numbers)

901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920

Advertised Products

951 Desktop computers
952 Notebook computers
953 DTP/Presentation software
954 Monitors and video boards
955 Accounting software
956 Draw/paint software
957 Network/sharing products
958 Printers
959 Multimedia products
960 Utilities
961 Mail order companies
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Advertiser Index A-Z

Get more information—circle the appropriate number on the reader service card.

Reader Service Number		Page Number
208	3M Data Storage	231-233
45	A.P.C.	100-101
229	Acer	71-75
–	Acma Computers	259
51	AGFA	96
9	ALR	23
38	AMS Computer	306-307
16	Apple	18
52	Apple	214-215
8	Arlington Computer Products	314
246	Ask LCD Display Systems	110
58	AST Research	S10
87	AST Research	174-175
44	AST Research	283
6	AST Research	285
4	AT&T GIS	56-57
22	Austin/IPC Technologies, Inc.	36-39
–	Autodesk	189
91	Caere	31
21	Caere (CAD Division)	M1
–	Canon USA	2-3
–	Canon USA	20-21
26	Clear Software	44
19	Colorado Memory Systems	234
61	Compaq Computer	112-113
35	Compaq Computer	246-247
83	Compaq Direct Plus Corp.	80-81
33	Compuserve	271
68	Computer Discount Warehouse	302-305
86	Connectix	95
29	Connectix	97
59	Conner Peripherals	127
67	Corel Corporation	209
48	Corel Corporation	257
56	Cougar Mountain Software	328A
54	Creative Labs	54
74	CTX International	207
162	Daceasy, Inc.	239
113	Datasonix	201
171	DataViz	M8
–	Dell	88-89
–	Dell	338A-D

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Index

Reader Service Number		Page Number
–	Dell	C5-C8
49	Delphi Internet Services	117
60	Diamond Multimedia Systems	161
84	DTK, Inc.	289
135	Edmark	S8
134	Education Marketing	L10-L11
223	EA Kids	S12-S13
142	EPS Technologies, Inc.	M2-M3
107	Everex Systems	187
153	Fujitsu	196-197
111	Fusion	312
72	Future Micro	300
–	Gateway 2000	45-53
–	Gateway 2000	149-152
101	Globalink	111
–	Hewlett Packard PC	162-163
–	HP - Laserjet Printer	40
125	Hyundai	291
–	IBM PC Direct	156-157
–	IBM Corporation	S2-S3
–	IBM Corporation	S6
–	IBM Corporation	146-147
–	IBM PC Direct	274-275
–	IDG Books Worldwide	287
188	Info Imaging	178-179
130	Information Builders	L14
–	Intel	34
–	Intel	98-99
159	International Jensen, Inc.	M10
127	IPS	M4
156	Keystone Learning Systems	310
–	LA TRADE	313
138	Landmark Research	76
206	LearnKey, Inc.	108
178	Lexmark	136
96	LG Electronics USA, Inc.	273
241	Logitech	65
–	Lotus	83-86
128	LucasArts Entertainment Co.	269
165	LucasArts Entertainment Co.	M12
168	Lumina Office Products	M9
123	Matrox Electronic Systems	107
147	MegaHaus Hard Drives	316
182	Micrografx	177
161	MicroHelp	102-103
57	MICRON Computer, Inc.	92-93
217	MICRON Computer, Inc.	315
–	Microsoft	42-43
–	Microsoft	134-135
–	Microsoft	218-219
64	Midwest Micro	293-299
172	MIS	301
205	NEC Monitors	28-29
203	NEC-CD ROM	C2-P1
169	Netcom	159
–	Nokia	14
–	Novell	M6-M7
176	Nview	22
–	Okidata	91
195	PC America	277
–	PC Connection	265
–	PC Expo 1995	335
–	PC World Connect	12
–	PC World Connect	281
–	PC World Connect	217
–	PC World Online	279-280
129	PCs Compleat	328B-C
189	Phillips Interactive	S15
145	Pinnacle Micro	69
212	PKWARE, Inc.	32
230	Plextor	133
227	Polywell	317
151	Princeton Graphic Systems	244
–	Prodigy	221-222
–	PROFOUND	24
–	QMS	183
225	Quarterdeck Office Systems	203
214	SAG Electronics	79
198	Samsung Electronics	13
213	Samtron Displays, Inc.	33
–	Scitor Corporation	26
209	Seagate	261
158	Seiko Instruments	67
232	ShortCut Software	328D
–	Softblox	M5
–	Software Publishing	190-191
–	Software Publishing	193
177	Software Support, Inc.	M11
253	SPSS, Inc.	35
210	STB Systems	241
196	T/Maker	S14
–	TeamWARE	104-105
124	Tektronix	210-211
244	Texas Instruments	128-129
220	Texas Instruments	254-255
228	Toshiba	242-243
–	Toyota Motor Sales	248
34	Traveling Software	267
240	Twinhead	131
28	Unlimited Systems Corp.	10
148	USA Flex	308-309
224	ViewSonic	109
–	Village Software	L26
–	Visio	115
187	Visioneer	25
197	WinBook	16-17
–	Windows Exchange	311
–	Windows World - Chicago	337
191	Xerox Corporation	140
257	Xerox Corporation	195
89	Zenith Data Systems	118-119
237	Zeos International, Ltd.	6-7
219	Zeos International, Ltd.	11
193	Zeos International, Ltd.	8-9

Advertiser Index by Product Category

Get more information—circle the appropriate number on the reader service card.

HARDWARE

Boards/Cards/Chips

–	Intel	34
–	Intel	98-99
123	Matrox Electronic Systems	107
210	STB Systems	241

Communications/Fax/Modems

28	Unlimited Systems Corp.	10

Desktop Publishing

44	AST Research	283
6	AST Research	285
87	AST Research	174-175
58	AST Research	S10
–	QMS	183

Input Devices

127	IPS	M4
241	Logitech	65
–	Microsoft	134-135
240	Twinhead	131

Local Area Networks

–	IBM Corporation	146-147
–	IBM Corporation	156-157
214	SAG Electronics	79

Laptop/Notebooks

22	Austin/IPC Technologies, Inc.	36-39
83	Compaq Direct Plus Corp.	80-81
–	Dell	338A-D
–	Dell	C5-C8
107	Everex Systems	187
–	Gateway 2000	149-152
–	Gateway 2000	45-53
129	PCs Compleat	328B-C
244	Texas Instruments	128-129
220	Texas Instruments	254-255
228	Toshiba	242-243
197	WinBook	16-17
89	Zenith Data Systems	118-119
193	Zeos International, Ltd.	8-9

Multimedia

246	Ask LCD Display Systems	110
54	Creative Labs	54
60	Diamond Multimedia Systems	161
159	International Jensen, Inc.	M10
203	NEC-CD ROM	C2-P1
230	Plextor	133

Monitors/Displays

74	CTX International	207
125	Hyundai	291
96	LG Electronics USA, Inc.	273
205	NEC Monitors	28-29
–	Nokia	14
176	Nview	22
151	Princeton Graphics Systems	244
198	Samsung Electronics	13
213	Samtron Displays, Inc.	33
224	ViewSonic	109

Computers

229	Acer	71-75
–	Acma Computers	259
9	ALR	23
38	AMS Computer	306-307
16	Apple	18
52	Apple	214-215
4	AT&T GIS	56-57
22	Austin/IPC Technologies, Inc.	36-39
61	Compaq Computer	112-113
35	Compaq Computer	246-247
–	Dell	338A-D
–	Dell	C5-C8
84	DTK, Inc.	289
142	EPS Technologies, Inc.	M2-M3
–	Gateway 2000	149-152
–	Gateway 2000	45-53
–	Hewlett Packard PC	162-163
–	IBM Corporation	274-275
–	IBM Corporation	S2-S3
217	MICRON Computer, Inc.	315
57	MICRON Computer, Inc.	92-93
172	MIS	301
129	PCs Compleat	328B-C
227	Polywell	317
–	Quantex	169-172
219	Zeos International, Ltd.	11

Printers/Plotters

45	APC	100-101
–	Canon USA	2-3
–	HP - Laserjet Printer	40
178	Lexmark	136
–	Okidata	91
–	QMS	183
158	Seiko Instruments	67
191	Xerox Corporation	140
257	Xerox Corporation	195

Peripheral/Sharing Devices

168	Lumina Office Products	M9
34	Traveling Software	267

Storage/Backup Devices

208	3M Data Storage	231-233
19	Colorado Memory Systems	234
59	Conner Peripherals	127
113	Datasonix	201
153	Fujitsu	196-197
147	Mega Haus Hard Drives	316
145	Pinnacle Micro	69
214	SAG Electronics	79
209	Seagate	261

Scanners/Digitizers

51	AGFA	96
–	Canon USA	20-21
187	Visioneer	25

Systems

–	Dell	88-89
217	MICRON Computer, Inc.	315
57	MICRON Computer, Inc.	92-93
214	SAG Electronics	79

MISCELLANEOUS

Mail Order

8	Arlington Computer	314
68	Computer Discount Warehouse	302-305
72	Future Micro	300
–	LA TRADE	313
138	Landmark Research	76
147	Mega Haus Hard Drives	316
64	Midwest Micro	293-299
–	PC Connection	265
214	SAG Electronics	79
148	USA Flex	308-309
–	Village Software	L26
–	Windows Exchange	311

On-Line Services

33	Compuserve	271
49	Delphi Internet Services	117
–	PC World Online	279-280
–	Prodigy	221-222
–	PROFOUND	24

Books/Periodicals/Subscriptions

–	IDG Books Worldwide	287

Service/Support

–	PC World Connect	12

Index

Reader Service Number — Page Number

– PC World Connect 281
– PC World Connect 217
177 Software Support, Inc. M11
237 Zeos International, Ltd. 6-7

Trade Shows
– PC Expo 1995 335
– Windows World - Chicago 337

Training
134 Education Marketing . . . L10-L11
156 Keystone Learning Systems . . . 310
206 LearnKey, Inc. 108

SOFTWARE

Accounting/Financial
56 Cougar Mountain Software 328A
162 Daceasy, Inc. 239

CAD/CAM
– Autodesk Retail Products 189

Communications/Fax/Modems
169 Netcom 159
187 Visioneer 25

Dataconversion
171 DataViz M8

Desktop Publishing
21 Caere (CAD Division) M1

Education
135 Edmark S8
223 Electronic Arts S12-S13
189 Phillips Interactive Media S15
196 T/Maker S14

Entertainment
165 LucasArts Entertainment Co. M12
128 LucasArts Entertainment Co. 269
189 Phillips Interactive Media S15

Graphics
48 Corel Corporation 257
182 Micrografx 177
124 Tektronix 210-211
– Visio 115

Groupware
130 Information Builders L14
– Lotus 83-86

Management
195 PC America 277

Multimedia
67 Corel Corporation 209
48 Corel Corporation 257
– IBM Corporation S6
– Toyota Motor Sales 248

Optical Character Recognition
91 Caere 31

Other
26 Clear Software 44
67 Corel Corporation 209

Presentation Graphics
– Software Publishing 193
– Software Publishing 190-191

Project Management
– Scitor Corporation 26

Reader Service Number — Page Number

Operating Systems
16 Apple 18

Statistics
253 SPSS, Inc. 35

Software Suites
– Microsoft 42-43
– Microsoft 218-219
– TeamWARE 104-105

Utilities
86 Connectix 95
29 Connectix 97
188 Info Imaging 178-179
138 Landmark Research 76
161 MicroHelp 102-103
212 PKWARE, Inc. 32
225 Quarterdeck Office Systems . . 203
– Softblox M5

Video
156 Keystone Learning Systems . . . 310
206 LearnKey, Inc. 108

Windows
162 Daceasy, Inc. 239
111 Fusion 312
– Windows Exchange 311

Word Processing/Aids
101 Globalink 111
– Novell M6-M7
232 ShortCut Software 328D

Products Featured in Editorial

Get more information—circle the appropriate number on the reader service card.

Accounting
817 Peachtree First Accounting 1.0, Peachtree Software 90

Add-On Board
615 ATI Graphics Xpression, ATI . . 245
618 Cardex Trio64, Cardex 245
613 Diamond Stealth 64 DRAM², Diamond Multimedia 245
608 ESP-2 Communications Accelerator, Hayes Microcomputer Products 167
616 Hercules Stingray 64, Hercules 245
610 Hercules Terminator 64 DRAM, Hercules 245
614 Paradise Bahamas 64, Western Digital 245
612 rPC FireStorm64, rPC 245
619 STB LightSpeed, STB Systems 245
611 STB Powergraph 64, STB Systems 245
617 STB Powergraph Pro, STB Systems 245
746 UltraSound Ace, Advanced Gravis 116
832 Video Blaster RT3000, Creative Labs 64

Business Application
821 TeamFlow 4 for Windows, CFM 95

Reader Service Number — Page Number

CD-ROM Drive
738 CD940 Portable CD-ROM Drive, EXP Computers 114
709 Mountain CD7 Minichanger, Nakamichi 252
728 Teac SuperQuad 4X Combo, Teac America 260

Communications
762 01/Fax 3.0, 01 Communique Laboratory 154
768 01/Fax 3.1, 01 Communique Laboratory 158
763 Bitware 3.2, Cheyenne Communications, ... 155
769 Bitware 4.0, Cheyenne Communications, ... 158
764 Commworks 1.0, Traveling Software 155
765 Delrina Communications Suite 2.1, Delrina 155
770 HotFax, Smith Micro Software 158
771 Online Discovery, SofNet 158
766 Procomm Plus 2.0 for Windows, Datastorm Technologies 160
767 Qmodem Pro 1.1 for Windows, Mustang Software 160
760 PowerSync 2.0, Linkpro 110
609 TurboCommander, Pacific CommWare 167

Computer System
650 Acma P100, Acma Computer . . 185
692 Acom Patriot 4000 540, Acom . . 205
688 Acom Patriot 4000 DX4-100, Acom 205
674 AST Ascentia 910N, AST Computer 205
772 AST Bravo MS-T 4/66d, AST Computer 213
773 AST Premmia GX P/90, AST Computer 213
774 AT&T Globalyst 250, AT&T Global Information Solutions . . 213
689 Austin Business Audio 4/75, Austin Direct 205
682 Austin Business Audio 4/100, Austin Direct 205
669 Blackship Atlantis, Blackship Computer Systems 199
775 Blackship Atlantis 66, Blackship Computer Systems 216
776 Blackship P-90 Neptune, Blackship Computer Systems . . 216
691 BSI GN8549D, Broadax Systems 205
777 BSI NP9546T CD-Sound Notebook, Broadax Systems . . . 220
778 Caliber Voyager 1, Caliber Computer 220
684 Compaq Contura 400c, Compaq Computer 205
651 Compaq Deskpro XL 590 Model 535/MX, Compaq Computer 185
677 Compaq LTE Elite, Compaq Computer 205
779 CompuAdd CP90p Mini-Tower, CompuAdd 220
780 DataStor Nx5100, Data Storage 220
657 Dell Dimension XPS P75, Dell Computer 199
637 Dell Dimension XPS P90, Dell Computer 185

Reader Service Number — Page Number

643 Dell Dimension XPS P100, Dell Computer 185
635 Dell Dimension XPS P120c, Dell Computer 185
686 Dell Latitude 450C, Dell Computer 205
687 Dell Latitude 475C, Dell Computer 205
676 Dell Latitude XP 4100CX, Dell Computer 205
639 Dell OptiPlex XMT 590, Dell Computer 185
642 Dell OptiPlex XMT 5100, Dell Computer 185
672 DFI Diamond 66, DFI 199
652 DFI Diamond P90, DFI 185
658 Diamond DT DX4/100 VIP, Diamond Technologies 199
781 Diamond DT P5-100 MPC Pro, Diamond Technologies 220
665 Diamond DX4-A100, Diamond Technologies 199
644 Digital Celebris XL 590, Digital Equipment 185
680 Digital HiNote Ultra CT475, Digital Equipment 205
782 DTK Quin-52M, DTK Computer 220
783 FutureTech FutureMate 3000, FutureTech 220
659 Gateway 2000 P5-60, Gateway 2000 199
667 Gateway 2000 P5-60 Family PC, Gateway 2000 199
647 Gateway 2000 P5-75, Gateway 2000 185
641 Gateway 2000 P5-100XL, Gateway 2000 185
638 Gateway 2000 P5-120, Gateway 2000 185
750 Globalyst 300 series, Globalyst 600 series; AT&T Global Information Solutions 77
784 HP OmniBook 4000CT, Hewlett-Packard 220
636 HP Vectra VL3 5/120, Hewlert-Packard 185
– IBM PC 750-P90, IBM 220
– IBM ThinkPad 755CE, IBM . . 205
785 Insight Hemisphere PCI P100 MM, Insight 220
786 Micro Express MicroFlex Pentium 75, Micro Express . . . 220
655 Micro Express MicroFlex- VL/80, Micro Express 199
660 Micro Express MicroFlex-VL/104, Micro Express 199
670 Micro Express MicroFlex-VL/D6, Micro Express 199
654 Micron 4100 Magnum, Micron Computer 199
661 Micron Family MPC LPX, Micron Computer 199
649 Micron P90 Home MPC, Micron Computer 185
640 Micron P90 PowerStation, Micron Computer 185
634 Micron P120 Millennia, Micron Computer 185
787 MPC TouchNote 799, MPC Technologies 220
645 NEC PowerMate VP75, NEC Technologies 185

Index

Reader Service Number — Page Number

681 NEC Versa P/75HC, NEC Technologies 205
662 Netis N566, Netis Technology . . 199
788 Netis N566M, Netis Technology 220
789 NMC Expert System/N-100, National MicroComputers 220
656 Polywell Poly 486-80VB, Polywell Computers 199
664 Polywell Poly 486-100/VP4, Polywell Computers 199
663 Polywell Poly 560MPC, Polywell Computers 199
668 Quantex QP5/60 PM-2, Quantex Microsystems 199
646 Quantex QP5/90 W-3, Quantex Microsystems 185
690 Sceptre SoundX Series 1000, Sceptre Technologies 205
790 Sharp PC-8700, Sharp Electronics 223
791 Sharp PC-8900, Sharp Electronics 223
653 Tagram Thunderbolt XL, Tagram 185
675 Toshiba T4900CT, Toshiba America Information Systems . . 205
671 USA Flex DX4-100 Desktop, USA Flex 199
673 USA Flex PT60 Tower, USA Flex 199
647 USA Flex PT90 MidTower, USA Flex 185
666 Vektron PCI Power Station P-90, Vektron Computer 199
685 WinBook XP DX2/50, WinBook Computer 205
678 WinBook XP DX4-100 8/520 Dual-Scan, WinBook Computer 205
679 WinBook XP DX4-100 8/520 TFT, WinBook Computer 205
683 WinBook XP SX-33 Monochrome, WinBook Computer 205
792 Zeos Pantera P-120, Zeos Int'l . . 223

Display
744 LitePro 580, LitePro 760; In Focus Systems 116
740 Pivot 1700, Portrait Display Labs 114

E-mail
741 Off-Line Xpress 1.0 for Windows, Mustang Software 114

Educational
704 American Journey 1896–1945, Ibis Communications 251
904 Aviation Adventure, Knowledge Adventure S9
904 The Book of Shadowboxes, IBM Multimedia Studio S4
697 Material World, Starpress Multimedia 102
710 A Passion for Art, Corbis Publishing 252
904 Sammy's Science House, Edmark S4
904 SimTown, Maxis S7
707 The Ultimate Frank Lloyd Wright: America's Architect, Microsoft 251
904 Where in the World is Carmen Sandiego? Junior Detective Edition, Broderbund Software . . S7

Entertainment/Game
701 100 Japanese Photographers, 1993, Synergy Interactive 250
904 Anno's Learning Games, Putnam New Media S7
715 Blown Away, IVI Publishing . . . 252
720 Doom II: Hell on Earth, GT Interactive 254
904 Freddi Fish and The Case of The Missing Kelp Seeds, Humongous Entertainment . . . S4
714 Gadget, Synergy Interactive . . . 253
716 The Incredible toon Machine, Sierra Online 253
904 The Incredible toon Machine, Sierra Online S7
693 Johnny Mnemonic, Sony Imagesoft 336
705 Mega Movie Guide 3.0, InfoBusiness 251
904 Microsoft Complete Baseball Guide, Microsoft S9
712 Mountain Biking, Media Mosaic 253
706 The Multimedia Cartoon Studio, Byron Press Multimedia 251
904 Nickelodeon Director's Lab, Viacom New Media S7
702 One Tribe, Virgin Sound and Vision 250
904 Scooter's Magic Castle, ABC/EA Home Software S4
904 SimTower, Maxis S9
695 Slam City With Scotty Pippen, Digital Pictures 336
713 Trouble Is My Business, The Raymond Chandler Library, Byron Preiss Multimedia 252
719 The Vortex: Quantum Gate II, HyperBole Studios 254
718 Unnecessary Roughness '95, Accolade 253
696 Virtual Pool, Interplay Productions 336

Fax-Modem
601 Hayes Optima 288 V.34/V.FC + Fax, Hayes Microcomputer Products 167
602 Motorola V.34R, Motorola ISG . . 167
603 Multi-Tech MT2834BA-ISI, Multi-Tech Systems 168
742 NovaPak 144, NovaLink Technologies 114
604 Practical Peripherals PC288LCD V.34, Practical Peripherals 168
605 Supra FaxModem 288, Supra . . 173
606 U.S. Robotics Sportster 28.8, U.S. Robotics 173
607 Zoom FaxModem V.34X, Zoom Telephonics 173

Financial
816 Individual Stock Investor 3.0, Design Creations 87
– The Parents' Guide to Money, Intuit 103

Graphics
833 Corel Stock Photo Library, Corel 64
836 PhotoWorks Plus, Seattle FilmWorks 64

Groupware
633 Collabra Share, Collabra Software 44

Hypertext
835 HotMetal Pro, SoftQuad 64
837 WebAuthor for Word for Windows, Quarterdeck Office Systems . . . 64

Image Editing
834 Fractal Design Painter, Fractal Design 64

Information Management
743 GoldSync, Elan Software 114

Input Device
830 Kodak Digital Camera 40, Eastman Kodak 64
752 LifeTime Mouse, Key Tronic . . 78
754 ProAgio, Mouse Systems 78
753 TrackMan Vista, Logitech 78

Internet Tool
– Cello 1.01a, The Legal Information Institute, Cornell Law School 126
620 Enhanced Mosaic 2.0, Spyglass 130
621 Internet Chameleon 4.1, NetManage 130
723 The Internet for Everybody, Emerging Technology Applications/Point Productions 258
622 InternetWorks 1.0, NaviSoft . . . 132
623 Mosaic in a Box 1.0, Spry, CompuServe Internet Division 132
– NCSA Mosaic 2.009a, National Center for Supercomputing Applications 137
625 Netscape Navigator 1.0, Netscape Communications . . . 138
626 SuperHighway Access for Windows, Frontier Technologies 139
– winWeb 1.0 A2.3, EInet 139

LAN Application
758 RadioLAN/10, RadioLAN . . . 106

Mapping
906 AAA Trip Planner, Compton's New Media S16
819 MapLinx 3.0 for Windows, MapLinx 94
906 TripMaker, Rand McNally . . . S16

Miscellaneous
708 Virtual Guitar, Ahead 251

Music
703 Bob Dylan: Highway 61 Interactive, Graphix Zone 250
694 Music Net, MNI 336
700 Rock 'n' Roll Your Own, Compton's New Media 250
711 Xplora 1 Peter Gabriel's Secret World, Interplay Productions . . 252

Online Service
805 America Online, America Online 143
810 Apple Computer's eWorld, Apple Computer 144
811 AT&T's Interchange, AT&T . . 144
812 AT&T's PersonaLink, AT&T . . 144
806 CompuServe, CompuServe . . . 143
807 Delphi Internet, Delphi Internet Services 145
808 GEnie, GEnie 145
813 The Microsoft Network, Microsoft 144
809 Prodigy, Prodigy Services 148
748 WinCIM 1.4, CompuServe . . . 116

Personal Information Manager
739 InfoRecall Pro 5.0, Phantech Software 114
815 Sidekick 2.0 for Windows, Starfish Software 87

Printer
905 BJC-4000, BJC-600e; Canon Computer S12
755 Canon BJC-70, Canon Computer Systems 82
905 DeskJet 540, DeskJet 560C; Hewlett-Packard S13
905 ExecJet IIc, Lexmark Int'l . . . S12
756 HP ScanJet 3c, Hewlett-Packard 82
747 Primax ColorMobile Office, Primax Electronics 116
– Stylus Color, Epson America . . . S12

Project Management
630 A Project/Event Planner, Sapphire Software 338

Reference
722 American Sign Language Dictionary, HarperCollins Interactive 258
631 Business Library, Allegro New Media 338
730 Complete World Bartender Guide, Media Solutions Int'l . . . 256
726 Dr. Ruth's Encyclopedia of Sex, Creative Multimedia 260
727 The Joy of Sex, Philips 260
632 The Legal Guide for Starting and Running a Small Business, Nolo Press 338
725 The Motion Picture Guide, CineBooks 258
729 The MultiMedia Typing Instructor, Individual Software . . 268

Remote Access
757 Timbuktu Pro for Networks 1.0, Farallon Computing 106

Sales/Marketing
745 Maximizer 3.0 for Windows, Modatech Systems Int'l 116

Scanner
831 Pro Imager 4000, PixelCraft 64

Scheduling Software
759 TimeVision Network Scheduler, CE Software 108

Sound Device
724 Vivid 3D Pro, NuReality 258
717 YST-SS1010 Speakers, Yamaha Corp. of America 253

Tape Backup
751 HP Colorado T1000, Hewlett-Packard 77

User Group
761 MicroLink PC Users Group, . . 263

Utility
820 Boris, StarBase 94
822 CD Cabin for Windows, The Aldridge Company 97
818 UnInstaller 3, MicroHelp 90

Word Processing Utility
749 Working Watermarker, Working Software 116

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Cyberpunk Johnny, Basketball Madness, and Practice Pool

You bought that behemoth multimedia PC so you could cruise the Internet, work at home, and keep track of your family's finances, right? You and I *both* know you bought it because you wanted a monster game machine.

Admit that, and you'll have a clear conscience when you go scouting for games. As this month's guest columnist, I've picked a bevy of first-rate titles that won't disappoint or make you regret your purchase. Work at home? Sure you will—just not today.

Johnny Mnemonic. Based on the movie of the same name—which in turn is based on an *Omni* magazine short story by cyberpunk sci-fi author William Gibson—the two-disc Johnny Mnemonic isn't the first game to rely exclusively on video. But it *is* the most ambitious. You play Johnny, a data smuggler with a memory chip embedded in his brain. He's trying to stay one step ahead of everyone who wants him dead. Plot aside, what makes Johnny Mnemonic memorable is its video. When the scene drops into a letterbox format, you direct Johnny to move, use an object, go through a door, and solve a puzzle. Sounds passive, but it isn't.

Slam City With Scottie Pippen. Finally popped for a Pentium? This basketball shooting match is one game that may make the investment worthwhile (a non-Pentium CD-ROM will be out by the time you read this). Like Johnny Mnemonic, Slam City is all video: Its over-the-shoulder view drops you into some tough one-on-one action against five players in a playgroundlike setting. Simple controls let you move left and right, time a jump shot, break for the dunk, stick your hands in the air, block shots, and even take a crack at a steal.

This game may seem like easy stuff, but it's often quite intimidating: You're gonna get blocked a lot. If you play tough, you get to go against Scottie Pippen (is he a Bull or isn't he?). Great fun.

Virtual Pool. What's a couple of racks without a couple of brews? I would have said "*nada*, nothin', *nichts*" until I got behind the cue in this CD-ROM. Virtual Pool may be virtual, but it's the slickest game on fake felt I've ever seen.

You lean over a 3-D table, which you can view from any angle. Tracking lines help you plot the path of every ball *before* you shoot; the cue tip and butt can be moved to add English or set up a trick shot, and an undo feature lets you reshoot until you get it right. (Try doing *that* in the pool hall with a shark waiting for your table.) Network and modem play lets you get some competition, and a variety of games—from eight ball and straight pool to rotation and nine ball—keep it interesting. Good enough to use as practice for the real thing.

Music Net. When you need new tunes but are too tired to head for the mall, drop this subscription CD-ROM into the caddy. Essentially a music store on disc, Music Net offers audio clips, video footage, and album covers from over 250 CDs and tapes. It includes the major music categories, from rock, pop, and rhythm and blues to country, jazz, folk, and rap. The button-happy interface lets you search by artist or album, then listen to selected tracks or watch a quickie video.

As you browse Music Net, you put together a shopping list. You can then order by modem; via E-mail to CompuServe, Prodigy, or America Online (the line's unsecured, so you don't want to transmit a credit card number this way); by fax; or via a toll-free phone call. Prices range from $12 to $16. You pay for the disc, of course, but if you shop often, you'll make it up in saved gas money.

When Johnny Mnemonic's video-based action takes a break, you decide what he does next.

- **Johnny Mnemonic** price not set at press time; Sony Imagesoft; 800/922-7669
  Reader service no. 693
- **Music Net** $8.99 per quarterly disc, full-year subscription $29.95; MNI; 800/375-6874
  Reader service no. 694
- **Slam City With Scottie Pippen** $59.95; Digital Pictures; 415/345-0445
  Reader service no. 695
- **Virtual Pool** about $50; Interplay Productions; 800/969-4263
  Reader service no. 696

Gregg Keizer is a freelance writer living in Eugene, Oregon. He can be reached on the Internet at gkeizer@rain.com.

By Gregg Keizer

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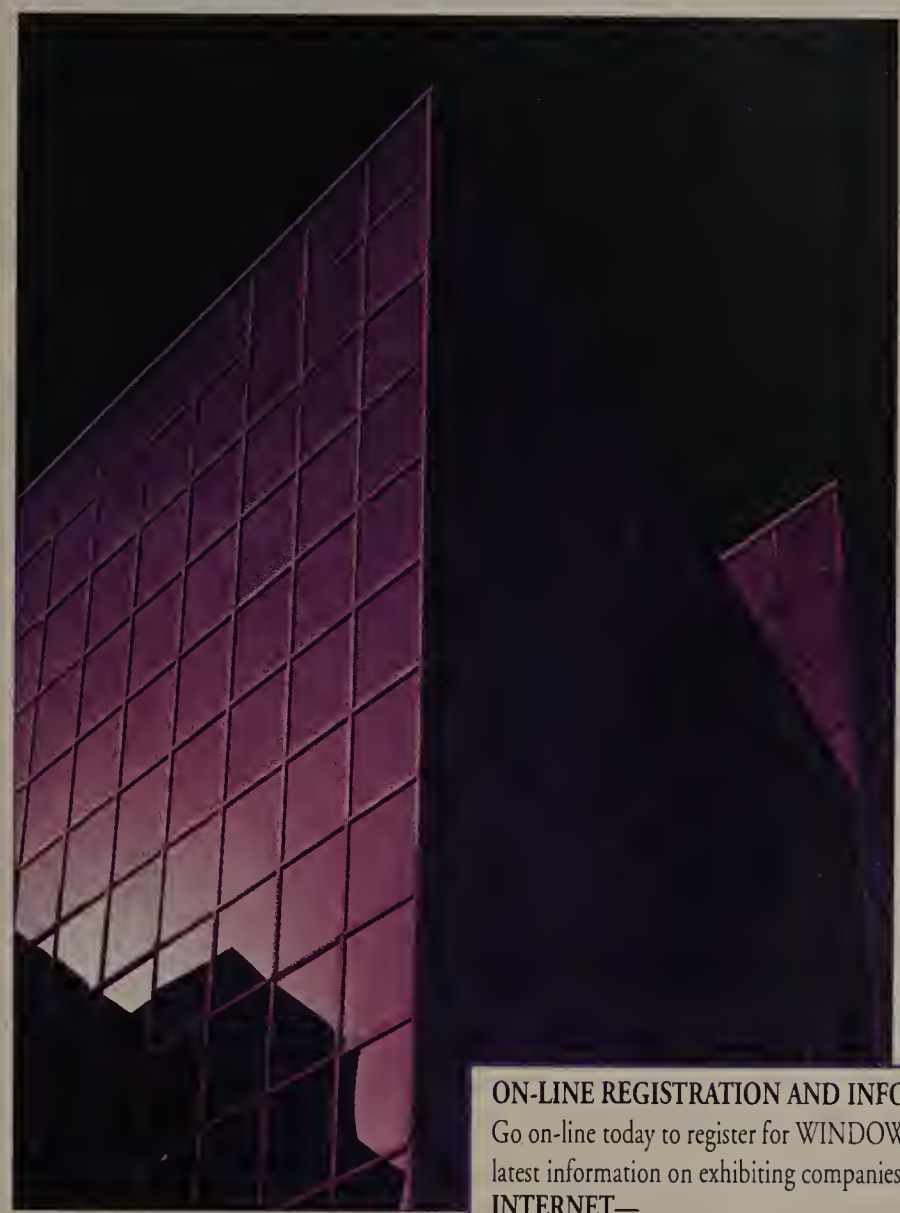

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Home Is Where the Business Is

What do the words *freedom* and *independence* make you think of? Besides the American Revolution, that is. How about starting your own business? I've done it, more than a few times, working long and hard to get my dreams off the ground. It's sometimes been an uphill battle, but I've been successful (most of the time), and I'm convinced it was worth every drop of sweat. And let me tell you: It's a lot easier with a computer.

The first rule of starting a business is to learn from someone else's experience. If I had my druthers, I'd hire a bunch of $150-an-hour experts. But because I have more druthers than money, I rely on information both on disk and online.

High on my list is Allegro New Media's Business Library, a CD-ROM with 12 best-selling business books and three videos. The most valuable of the bunch are *Successful Direct Marketing Techniques, Successful Telemarketing,* and *Finance & Accounting for Non-Financial Managers.* At $34 discounted, the set gave me my money's worth.

You'll hate doing it, but you'll have to learn the legal mumbo jumbo. I recommend Nolo Press's nifty electronic book, The Legal Guide for Starting and Running a Small Business. The guide has given me answers to dozens of basic questions that otherwise would have required the services of my attorney Bernie. For example, I've gotten guidance on protecting my business name, on hiring (or becoming) an independent contractor, and on regulations for sole proprietors. Even if you read only the section on business tax basics, *especially* the part about self-employment and estimated taxes, you'll save enough to pay for the program. If I had started out with the Legal Guide at hand, my first year of decent earnings might not have ended up with an enormous payment to the IRS.

Online Consultants

If you have a modem, a plethora of terrific advice is available to you 24 hours a day. On CompuServe, try the PR and Marketing (**go prsig**), Working from Home (**go work**), and Entrepreneurs' Small Business (**go usen**) forums. America Online also has an excellent Small Business center (keyword: **small business**). Prodigy's Business and Finance area has Nexis's Small Business Advisor, which offers dozens of low-cost business documents. And if you're on the World Wide Web, check out the Lycos Catalog at **http://lycos.cs.cmu.edu/** and Group Cortex's NetSearch at **http://www.netweb.com/cortex/cgi-bin/netsearch**. In both places, search for **business**.

You can't start a business without a business plan and a set of goals. Not only do they give you a clear view of where you're going, but no one's going to lend you money without them.

Don't cringe, but I'm going to recommend that you use a low-end project manager to bolster your business plan. See, your plan needs both short-term and long-term goals—the former give you a sense of accomplishment and the courage to continue; the latter give you something to strive for. I found Sapphire Software's A Project/Event Planner to be a superb shareware program that keeps me on track. It's cheap—$37—and it doesn't take a degree in rocket science to learn. I like it because I can view my goals in weeks, months, and years, and shift events forward and backward in time. Download a copy for yourself—look for **aplanr.zip** on PC World Online.

Starting your own business is risky, exciting, and scary. But once you try it—and have a little success—you'll discover that there's nothing like it in the world.

- **A Project/Event Planner** $37; Sapphire Software Inc.; 808/395-5587, 71223,3653 (CompuServe)
  Reader service no. 630
- **Business Library** $59.95; Allegro New Media; 800/424-1992, 201/808-2645 (fax)
  Reader service no.631
- **The Legal Guide for Starting and Running a Small Business** $24.95; Nolo Press; 800/992-6656, 510/548-5902 (fax)
  Reader service no. 632

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By Steve Bass

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